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Entire Blast Furnace Plant Salvaged

War Time Economics Applied in Removal of
a Midland Stack and Its Re-erection at Sault
Ste. Marie—The Fluctuating Labor Supply

PARTICULAR interest attaches to the recent dismantling of a blast furnace at Midland, Ont., and its removal to Sault Ste. Marie, because practically the entire plant from the foundation was salvaged so that very little new material was required except that necessitated by the modernization of the plant and the increasing of its capacity. Various difficulties were encountered in carrying out the work on schedule, which included a scarcity of labor, severe weather and congested railroad facilities.

In order to meet the increased demand for its steel products, the Algoma Steel Corporation, Sault Ste. Marie, Ont., found it necessary to add to its pig iron production and to supply sufficient hot metal to keep its duplexing plant in operation at maximum output. Early in 1917 it decided to erect an additional blast furnace. However, after thor-

ough investigation, it decided that not only the cost of necessary equipment but the length of time required to secure it practically prohibited the undertaking. This led to the plan of purchasing some existing furnace not then operating.

Early in April the Algoma Steel Corporation purchased from the Canada Iron Corporation the more modern of the two blast furnaces located at Midland, Ont., about 400 miles from the Soo plant, and gave to Arthur G. McKee & Co., Cleveland, the contract to dismantle, ship and re-erect the plant at the Soo. The contract included supplying the additional material necessary to increase the output of the furnace and make it modern in every respect, and also stipulated that all the old material that could be salvaged, consistent with the plan, should be worked into the re-erected plant at the Soo, without in any way interfering with the operation of the



The Stack at Midland, Ont., Before Dismantling, Shown at the Left With View of Gas Mains. The re-erected furnace, skip hoist, stoves and other appurtenances at Soo, about 400 miles from its former site, are shown in the right-hand view ready to begin blowing



Start of Dismantling; All Gas Mains Down, the Cast House and Stack in Progress, the Power House Shown in the Fore-ground Still Intact

existing furnaces. In order that dismantling operations at Midland, the shipment of old material from there and new materials from elsewhere, and the operations at the new site should be carried on in a logical way, a progress schedule was prepared and followed.

The work of dismantling and re-erecting the furnaces presented some interesting problems. As it was impossible to secure the required labor in the vicinity of Midland and the Soo, this labor was procured at various points, a large part of it being shipped to the site from New York. The severe weather conditions at the Soo made it difficult to maintain a full quota of labor and added materially to the difficulty in maintaining efficiency in the force. Some idea of the variation in temperature can

be gathered from the chart above, which shows a variation from 94 deg. Fahr. above to 31 deg. below zero. A large part of the steel construction work was done during the cold months of December, January, February and March. The other chart indicates that in spite of the extreme weather conditions, a full working force was maintained. The work of dismantling and shipping the Midland plant was completed in 141 days, or considerably sooner than the time allotted in the schedule.

The entire power house, including blowing units, generating equipment, pumps, steam and water piping, wiring, etc., all the steel work for the furnaces and stoves, including hot and cold blast mains, 75 per cent of the stove brick and approximately 10 per cent of furnace brick were salvaged and worked into the re-erected furnaces. Some idea of the amount of material transported can be gained from the records of car shipments which show a total of 732 carloads of material shipped from Midland to the Soo.

The re-erection of the plant at Sault Ste. Marie was delayed because of changes in location decided upon by the Algoma Steel Corporation after a

large portion of the sub-structure for some of the larger units was completed and the units themselves partially installed. However, the work at the Soo was completed in 330 days after ground was broken. The re-erected furnace was blown in 336 days after the work of dismantling started at Midland.

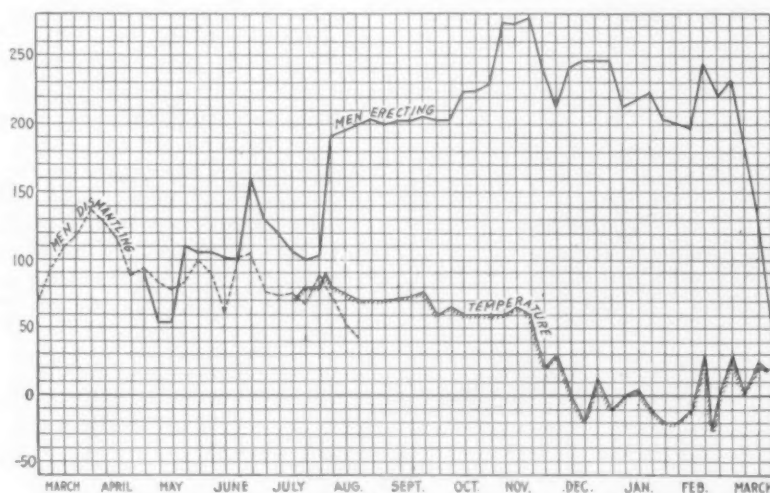
It will be noted from the curve in the chart that a greater number of men were used at Midland during the month of March, about two months before the foundation was completed at Sault Ste. Marie. This was obviously necessary for the reason that the parts which were dismantled last at Midland were the first to be re-erected at the Soo.

The congested condition of the railway transportation existing at the time this work was done was further augmented by the necessity of securing Federal licenses, figuring of duties, and other details of international transportation, due to the large number of individual shipments having to cross the border. The handling of incoming materials at the Soo was extremely difficult because the furnace was to be erected between two sets of main service railroad tracks, leading to the existing furnaces. The traffic on these tracks was practically continuous and the handling and storage of

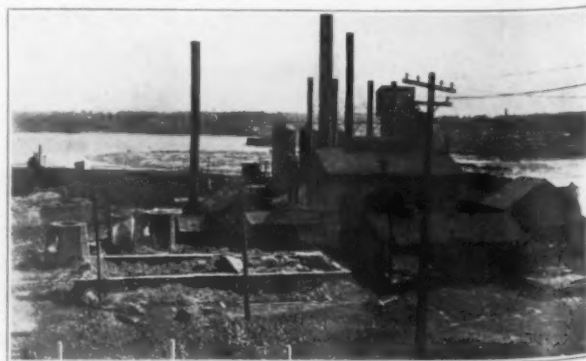
construction materials necessarily had to be carried on without any interruption to the plant operations and schedules of the tracks adjacent to the new furnace site.

The re-erected furnace was modernized by installing the McKee electric control on the stock distributor, new gas seal, new downcomers, copper cooling plates, new bosh bands

and bosh jacket, and new iron and cinder runners. A modern gas washer was also added, together with a very considerable amount of cold blast main for making available all existing blowing engines for operation on the rebuilt stack. While all the old stove materials were used, the type of stove lining was entirely changed. The old stoves had 9-inch square checkers but the old brick were relaid so as



A Full Working Force Was Maintained in Spite of the Extremely Cold Weather and the Abnormally Large Labor Turnover Incident to War Times



The Work of Tearing Down Completed and 732 Carloads of Materials Removed to Soo for Re-erection

to provide 4½-in. square checkers, thus very materially increasing the heating surface. Experience under actual operating conditions has demonstrated the higher efficiency anticipated for the re-erected stoves. The stoves were also fitted with new Geesman type of gas burners.

The stock bins were improved by applying McKee continuous gate bottoms to the old stock bins and adding new coke bins fitted with McKee cascade screens. The old Midland cast house structure was more than sufficient to provide the necessary cast house at the Soo and the remaining bays from

the old structure were used to provide a good sized general machine shop and repair shop. The redesigned plant, modernized for efficient operation, has a daily capacity of 400 tons, or 50 tons in excess of the old plant.

The work of dismantling and rebuilding the furnace was under the supervision of the following Algoma Steel Corporation officials: J. Frater Taylor, chairman of the board; W. C. Frantz, president; E. J. Best, consulting engineer; Charles A. Barr, former general manager, and David Kyle, present general manager.

TRAINING WOMEN BEGINS

Course at Case School Is Started and Will Continue for Two Months

The first course in the United States to train women for war work as employment managers in munition plants and other factories doing war essential work was opened in the Case School of Applied Science, Cleveland, last week. The Government is encouraging the employment of women in various industries to take the places of men called to the colors and the purpose of this course is to fit women to take charge of the employment of female labor. Training courses to fit men for this work have been conducted in the University of Rochester and Harvard University, but this is the first course of training provided exclusively for women. The course is under the direction of the United States Ordnance Department through the Committee on Labor Relations of the Cleveland Chamber of Commerce and Miss Mildred Chadsey of Western Reserve University is directing the work. Cleveland was selected as a suitable place for carrying on this training work because of the large number of plants engaged in various kinds of munition work in that city.

Applications for enrollment in the course were received from 200 women from all sections of the country, from whom 50 were selected. Many of these are college graduates, some have been teachers, and their ages ranged from 25 years up.

The course will differ materially in some respects from that given under the Government's direction for men in Eastern schools for the reason that few, if any, of the women taking the course have had any practical experience around a manufacturing plant. The men who have taken similar courses in the Eastern schools have for the most part been selected by companies with which they were connected in various capacities and were selected by their employers who believed that they had qualifications that would fit them for employment management.

The Cleveland course will continue for about two months and will consist of day-time factory work and evening class work. The students have been assigned to various manufacturing plants as regular factory operatives where they will put in regular hours and receive \$12 per week for this work. It is not expected, of course, that they will acquire a great deal of practical knowledge in machine shop work other than learn to operate one machine during that period. The object in employing them in factories is to make them familiar with the surroundings and the class of men who are employed and to get some insight into the life of an employee of some of the problems that confront the employment manager.

At the conclusion of the course in Cleveland, students who pledge themselves to definitely plan to become employment managers are to be given a six weeks' intensive course in employment managership at the University of Rochester, provided they have satisfactorily completed their preliminary course. Those who prefer may take an intensive course in New York, Boston, or Pittsburgh.

The Cleveland manufacturers are heartily co-operating in the work and have willingly taken the students into their shops in which they will gain the practical ex-

perience desired. The plants in which they are employed during the daytime include the American Mutilograph Co., Cleveland Hardware Co., Cleveland Metal Products Co., Hydraulic Pressed Steel Co., Osborn Mfg. Co., Standard Parts Co., Standard Tool Co., Warner & Swasey Co., Kirk-Latty Mfg. Co., and the Steel Products Co.

Fabricated Ship Corporation Organized at Milwaukee

The Fabricated Ship Corporation, Milwaukee, has been organized with a capital stock of \$600,000 by a combination of interests identified with the Newton and Coddington Engineering companies of Milwaukee, to establish a shipyard and engage in the construction of fabricated steel ships for the Emergency Fleet Corporation. It will be the first steel ship building plant at the port of Milwaukee. The organization was perfected following the award of a contract to the Newton and Coddington interests for the construction of nine steel mine-planters and four steel river transports, a total of 13 boats. The Coddington interests control the Lakeside Bridge & Steel Co., North Milwaukee, one of seven large fabricating and erecting shops located in Milwaukee. The new shipbuilding company has been able to make an advantageous lease of the dock property of the Petit Salt Co., lying between the north and south branches of the Menominee Canal at the foot of Twelfth Street, Milwaukee, and will begin work at once on the erection of seven berths and the necessary machine shops and assembling buildings. Much of the machinery and equipment has already been purchased, among the items being a locomotive crane to be furnished by the Bucyrus Co., South Milwaukee. It is expected that the first keel will be laid before Oct. 1. Delivery of the 13 boats will begin May 1, 1919, and one will be completed every 30 days thereafter.

The new corporation has completed its organization as follows: Managing directors, Ralph E. Newton, general executive and engineering supervision; Samuel C. Coddington, treasurer and supervision of fabrication; George C. Newton, in charge of mechanical plant and equipment of yards and ship construction; Thomas J. Baker, in charge of shipyard construction and outfitting. Alfred L. Newton is chief purchasing officer. Julius Thielacker is superintendent of steel erection.

Conversion of Machinery to War Purposes

A movement contemplating the conversion of much of the steel and copper plate engraving machinery in the country to war purposes was launched at the eighth annual convention of the National Association of Steel and Copper Plate Engravers held at St. Louis last week. It was estimated by speakers at the convention that at least a fourth of the machinery of the engraving industry and the man power to operate it could be used for stamping, punching and cutting metals for war supplies.

A war service committee headed by Theodore Isert of Louisville, Ky., secretary of the association, was appointed with instructions to confer with the regional war industries board and with the war industries committee of the National Chamber of Commerce to determine how this conversion of the engravers' machinery could best be accomplished.

Commissions on Government Contracts

New Order at Washington Brings Many Protests from Manufacturers—Some Selling Arrangements May Be Disturbed—New Contract Forms

WASHINGTON, July 23.—No action taken by the Government with respect to the general subject of war contracts has occasioned more perturbation among manufacturers than the recently promulgated letter of the Attorney General, published in *THE IRON AGE* of June 27, suggesting to the executive departments that there be incorporated in all contracts a provision under which contractors must certify that they have paid no commission to any one to procure the contract. The literal enforcement of this provision, which all the departments letting contracts for war material have been prompt to adopt, would be so subversive to the entire system now prevailing in the sales departments of the leading manufacturing concerns of the country that hundreds of protests are reaching Washington, many of them suggesting that the Government officials either do not understand the prevailing methods of doing business or do not intend to enforce the letter of the restriction suggested by the Department of Justice.

Commissions Figure Largely in Selling

As is well known, the great bulk of the business solicited by large manufacturers through their sales agents is handled on a commission basis, sometimes coupled with a salary or retainer, or a guarantee that the commissions shall reach a certain minimum. The impracticability of handling sales on a straight salary basis has long been demonstrated, and the almost universal adoption of the commission method is the best evidence of the necessity for its use. To force to a salary basis concerns doing a large amount of business with the Government—and manufacturers are now devoting 25 to 100 per cent of their facilities to war work—would have an exceedingly demoralizing effect, and in many cases would deprive the Government not only of competition but of the very helpful co-operation of expert sales agents who are frequently able to aid inexperienced officials in supplying the Government's needs.

For the purpose of advising manufacturers as to the real purposes of the Government and as to the interpretation to be put upon the provision in question, the correspondent of *THE IRON AGE* has conferred with the officials of the chief purchasing bureaus, and is enabled to present a statement, which, while unofficial, represents the present consensus of opinion. It should be understood, of course, that the whole question is under advisement in view of the large number of protests received and the numerous angles which the subject presents, and it is altogether probable that in the near future an authoritative announcement will be made, either by the Attorney General or the heads of the leading purchasing bureaus, more accurately defining the Government's aim and the exact scope of the new restriction.

The contract provision which has aroused so much interest among manufacturers doing business with the Government is as follows:

The contractor expressly warrants that he has employed no third person to solicit or obtain this contract in his behalf, or to cause or procure the same to be obtained upon compensation in any way contingent, in whole or in part, upon such procurement; and that he has not paid, or promised or agreed to pay, to any third person, in consideration of such procurement, or in compensation for services in connection therewith, any brokerage, commission, or percentage upon the amount receivable by him hereunder; and that he has not, in estimating the contract price demanded by him, included any sum by reason of such brokerage, commission or percentage; and that all moneys payable to him hereunder are free from obligation to any other person for services rendered in the procurement of this contract. He further agrees

that any breach of this warranty shall constitute adequate cause for the annulment of this contract by the United States, and that the United States may retain to its own use from any sums due or to become due thereunder an amount equal to any brokerage, commission, or percentage so paid.

Methods of Getting Government Business

A rough classification of the methods heretofore employed in the negotiation of contracts for war material brings them into five groups substantially as follows:

1. The responsible executives of the manufacturing companies negotiate the contracts by personal visits to Washington and conferences with the purchasing bureaus, or through correspondence.

2. Members of the regular sales organization of the manufacturing concerns procure the contracts for their companies by visits to Washington, the salesmen being compensated by salary or commission, or both.

3. Concerns maintaining offices in Washington, managed by salesmen more or less expert in their respective industries, negotiate contracts through such representatives, who are paid salaries or commissions, or both.

4. General manufacturers' agents, who frequently control exclusive selling agencies for several different concerns, at the same time handling more or less transient business for many other concerns, procure contracts for their principals, their compensation being almost invariably on the commission basis.

5. More or less irresponsible individuals maintaining offices in Washington, and advised of the needs of the Government through channels available to any enterprising person, solicit bids for manufacturers upon more or less unfounded claims as to their own ability to procure contracts, and in some cases succeed in doing so, usually as a result of the recognition by the Government of the reputation of the manufacturers and the quality of their goods, and never through the utilization of any so-called "pull" claimed to be exerted by the agents in question.

The Government's Aim as to Commissions

In recommending the adoption of the restrictive contract provision above quoted, the Department of Justice aimed at two things: First, the elimination of the unscrupulous agents grouped in the fifth class; and second, the establishment of such direct relations with manufacturers as would cut out, as far as practicable, the payment of all unnecessary commissions. The investigation which led up to the adoption of this provision disclosed a scandalous state of affairs. Hundreds of so-called agents doing business in Washington have been in the habit of soliciting business upon representations as to their influence with purchasing officials who have constituted very severe reflections upon the honor of such officials, and commissions received by them on contracts which they have obtained because of the quality and low price of samples entrusted to by reputable concerns have really been obtained by false pretenses. Arrests have been made, and judgments obtained in some of these cases, and the Government will be asked to impose the heaviest possible penalty. It is needless to say that no protests which are now receiving serious attention have been made on behalf of this class of agents.

As to the second, third and fourth classes, however, it is frankly admitted by the officials that the restrictive contract provision as to the payment of commissions appears on its face as a positive prohibition so sweeping as to make it necessary for contractors to change the existing methods of compensating their representatives.

tives. A close analysis of the provision, however, has been made by certain of the more important purchasing bureaus, like Supplies and Accounts of the Navy Department, and the suggestion is semi-officially made that the agents included in classes two and three, being included in the permanent organizations of the contractors, are not, in point of fact, "third parties" within the meaning of that term as here used, and that the term qualifies all the remaining clauses of the section in question. The practical application of this suggestion is necessarily left, at the present stage of the matter at least, to the contractors. If they consider the parties negotiating their contracts with the Government to be regular permanent members of their organizations they will probably be willing to accept the restrictive provision, thus certifying that they have paid no commissions to "third parties." Owing to the variations of practice in selling departments, it is obvious that no hard-and-fast rule can be laid down that would cover all cases.

General Agents Affected by Prohibition

With regard to the agents included in the fourth group, the officials of the purchasing bureaus here frankly assert that however reputable they may be, and however useful their services have been in times past to the manufacturing concerns they represent, they are barred from participating in Government contracts on a commission basis. It has been pointed out to the officials that in certain cases these parties are exclusive selling agents, some of them engineers of high technical ability, long experience, and unquestioned probity, but the answer is that they are "middlemen," and that the Government intends to cut out all such agents, not only because of the commissions involved, but also because it desires to establish direct relations with manufacturers for the purpose of arousing their interest in Government work and securing their co-operation, with a view, in some cases, to inducing them to undertake the production of goods not previously made.

As to the suggestion that in many cases manufacturers can much better afford to do business with the Government through expert agents working on a commission basis than to come to Washington personally, and that in some cases, at least, manufacturers have contracts with their selling agents which would prohibit them from making better prices to the Government or to any one else than the agents would make, the answer of the officials is that manufacturers must, of course, protect themselves, and that the new policy might in a few cases prove unprofitable to the Government. It is also intimated in this connection that the Government, in view of its war powers, might be in a position to set aside exclusive selling contracts, and insist upon prices representing only "reasonable profits." The fact is fully recognized that the new departure adopted at the Attorney General's suggestion will result in putting many general agents out of business in view of the extent to which the Government is absorbing almost the entire output of many producers. The only comment made officially in this connection is that "we are at war," and that individual interest must be subordinated to that of the general Government.

The New System of Buying

With the co-operation of the Department of Justice, the War Department has practically completed a system of control designed to protect the Government in the procurement of all war materials, and is putting the new system in operation under the direction of the General Staff. The new method provides for a review of every contract by boards of control, the centralizing of purchases, the standardization of contract clauses, a daily fiscal survey, and provisions for public information on War Department needs.

A new division of the general staff has been established to supervise the policy and practice of War Department purchases. Through the new organization it has been arranged to centralize the purchase of commodities falling within the same classification in

the hands of one bureau, so that now, for instance, one bureau, instead of five as heretofore, purchases all leather goods for the whole army, and similarly for cotton, hardware, and all the usual trade classifications of materials. This single step has eliminated competition among the bureaus, centered technical purchase among expert purchasers in each commodity, reduced the personnel engaged in specialized purchase, simplified the control of purchase methods, and resulted in the saving of a great deal of money to the Government.

Investigations were made to determine which of the five bureaus was best qualified to act as the sole War Department purchasing agent for each commodity. Decision has been made in nearly all cases of conflict. There has been set up in each bureau boards of awards which are the ultimate authority on the awards of all important contracts. These boards are composed of officers other than those who have conducted the actual negotiations.

A superior board of awards, composed of one officer from each of the bureau boards, sits in the general staff and passes on and presents to the Secretary of War for decision all questions of general policy, receives the instructions of the Secretary of War concerning such policies, and thus makes uniform throughout the War Department the execution of policies of purchase.

Settling on the Best Contract Form

Over six weeks ago, a committee composed of officers and civilians, whose duty has been to prepare the tens of thousands of contracts of the War Department, began an intensive study of every contract clause and policy in every agency of the War Department in an endeavor to provide, in the light of over a year's experience with war conditions, the form of contract clauses that would best safeguard the interests of the Government, with a view to prescribing for instant use well-considered and practice-proved forms for every conceivable circumstance of purchase. This committee is about ready to make its report.

On June 1 the general staff ordered that, except in cases of immediate necessity, no contracts should be made with sales agents, and that all War Department procurements should be negotiated either with the manufacturer or with recognized jobbers carrying the stocks on hand from which they proposed to supply the army.

In addition to this precaution, steps have been taken in conjunction with similar steps in the War Industries Board to mobilize the industries of the nation behind the needs of the War Department.

In order to regulate purchases in accordance with the appropriations of the department, an improvement in fiscal accounting has just been introduced. On July 1 an analysis of all War Department appropriations was reported to the Secretary of War in such a way as to show the precise status of each congressional appropriation on the close of the preceding day's business. These reports are now made daily.

A bureau has been created which receives the reports from each department at the end of the day's work. A force of clerks works at night on these reports and has ready by the following morning the totals for the Secretary of War and the general staff.

In addition to the review boards, a mechanical system for the analysis, comparison, and administrative scrutiny of every procurement transaction, great or small, is being set up in the general staff. By this system the essential details of every contract are tabulated and checks made to determine the cause of any variation of price or standard. There is also operating a single real estate office which is handling all real estate transactions.

The function of commandeering, requisitioning and issuing compulsory orders to the whole war machine has been centralized and intrusted to the general staff, as has also the determining of just compensation for all property commandeered and requisitioned for the War Department. Agencies for these purposes have been fully organized and have passed the stage of routine accomplishment.

W. L. C.

Mechanical Condition of Blast Furnace Coke*

Machine for Testing Hardness—Effect on Coke Consumption in Blast Furnaces— Action of Gases on Hard and Soft Coke

BY G. D. COCHRANE

THE onus of the manufacture of the coke is with the coke-oven manager, and it is to him the blast-furnace manager has to look for the regularity and quality of his supplies. It is no uncommon occurrence to find that the chief concern of the coke-oven manager is to get as large a percentage of coke and by-products from his ovens as possible and, so long as those percentages are satisfactory, to pay little attention to the mechanical condition of the coke made, with the result that the blast furnace suffers. There is an axiom supported by a few facts that have come to my notice in the past few years, which is as follows:

The practical success of the working of a blast furnace is chiefly dependent on the mechanical condition of the coke used.

This may appear to be a sweeping assertion, but I will endeavor to warrant it, subject to the reservation that the mechanical portion of the plant is in good average working condition. There is no doubt that the question of the mechanical condition of the coke is a controversial subject, but it has not received the attention and investigation that its importance in blast-furnace practice calls for.

I have ignored the mechanical and chemical conditions of the ores and fluxes, as, when making Cleveland iron, it will be agreed that there is practically no variation therein from one year's end to another. The percentage of ash in the coke and the analysis of the ash are factors that are more variable, which affect the coke consumption per ton of pig iron and the quality of iron directly, but are capable of anticipation and calculation. The coke hardness is a thing apart, and in my experience can be treated as such, although I fully recognize that it has its chemical actions and reactions to perform in the furnace, apart from its purely mechanical functions.

Meaning of Coke Hardness

In 1909 we installed a machine which was called the coke tester, and which was originated, I believe, by Greville Jones of the Clarence Ironworks, Middlesbrough. As a practical experiment it was a success, inasmuch as we were enabled to say whether a coke was good, bad or indifferent, from the hardness point of view, for utilization in the blast furnace.

It is of very simple design. It consists of a drum which is made to revolve at 18 revolutions per minute, with two angle-bars fixed inside to turn the coke over; there is also a hand-hole for insertion and extraction of the coke sample, and an indicator to note the revolutions.

To make a test for hardness a sample of coke is taken of about 56 lb. weight, consisting of lumps up to the size of one's fist, and dried on hot plates for 24 hr. Of this 28 lb. are weighed out and placed in the drum, and the cover plate screwed down. The drum is then revolved for 1000 revolutions at 18 revolutions per minute. The coke is next taken out and riddled over a $\frac{1}{8}$ -in. mesh, and that which remains on the riddle is weighed and the percentage of the original 28 lb. noted. That percentage we call the hardness of the coke.

By this means, after a few months I had a good comparative record, and by closely watching and comparing the furnace drivings with the coke hardness, I found that there was a very close connection between the two. I need not relate the detail which was gone through to eliminate every possible cause that might have misled us into believing the variations in the drivings were caused by the coke when the source of trouble lay else-

where; every care and precaution were taken, and we were eventually convinced that the coke alone was responsible for the variations in the drivings.

The next item to determine was at what point on the coke hardness scale the drivings commenced to fall off; this was found to lie between 74 and 74½ per cent of hardness, and in the past eight years this has been proved correct on so many occasions that I do not hesitate to say that in our own plant we know there will be slow driving and consequent trouble when the hardness falls below that percentage.

I have not been able to trace any additional advantage with coke of a higher percentage of hardness than 76 per cent, but on plants where a blast pressure in excess of 7 lb. per sq. in. is used or available, it may be found that the benefits derived from a hard coke may accrue to a higher percentage than I have mentioned.

When the hardness falls below 74 per cent a very marked falling off in the drivings takes place, and I find that the lower the percentage the worse are the drivings. I have had the experience in the last 12 months of using a considerable quantity of coke which has only averaged 70.5 per cent of hardness, and I estimate that the drivings of the blast furnaces have fallen 20 per cent. I do not, however, care to state definitely that percentage as due to mechanical troubles with the blowing plant, the blast has been very variable, and it is extremely difficult to apportion the blame correctly, but from past experience I do not think I am far out in my estimate.

With a 76 per cent hardness coke, and an average ash contents of 12.5 per cent, the daily drivings of the furnace is 48 rounds per 24 hr., with no allowance made for blast off, but with a pressure of 6½ lb. per sq. in. Immediately that the critical degree of hardness of 74 per cent is passed, a marked improvement in the drivings was immediately indicated, in spite of outside adverse factors appearing here and there.

Effect on Coke Consumption

The advantages of hard coke in its effect on coke consumption are many. When coke is charged into a blast furnace it immediately comes into contact with the ascending gases, which act upon it in a greater or lesser degree, dependent upon its mechanical condition and the temperature of the gases. Many experiments have been carried out in the laboratory to illustrate this reaction, and it has always been found that the gases have far less effect on hard coke.

Bell, in his book on the "Manufacture of Iron and Steel," gives the following experiments, which indicate a serious loss of carbon when using soft coke:

Trials of coke from two different collieries—the one being of known inferiority to the other—for decomposition of CO₂. The specimens were exposed side by side for different periods of time at a temperature of about 815 deg. C.

The trials indicated that while a ton of coke in the case of the better coke would in two hours lose 0.778 cwts., the waste on the poorer coke would be equal to 1.560 cwts. A second series gave similar results. Both indicate that the better quality coke continued at the end of eight hours less susceptible to the action of hot carbonic acid than the other with which it was compared.

In another part of the same work he says:

Specimens of coke were exposed at a bright red heat (1560 to 1580 deg. Fahr.) for the same time to the action of a current of carbonic acid. In the case of the soft coke 18.7 per cent of the carbon in the carbonic acid was reduced to the state of carbonic oxide, while in that of the hard coke the proportion of carbon so altered was only 7.3 per cent of the total quantity.

*From a paper presented at the spring meeting of the Iron and Steel Institute in London, England, May 2, 1918.

Following on the lines indicated above, I had an experiment made in the Ormesby Laboratory with the following result. Pieces of hard and soft coke were placed in crucibles containing carbonate of lime which supplied the CO_2 and covered with lids and placed side by side in the muffle for 45 min.

Action of Carbonic Acid on Hard and Soft Coke—Test Made at a Red Heat, 705 Deg. C. (1382 Deg. Fahr.)

	Hard Coke, Grams	Soft Coke, Grams
Before test, weight of coke.....	13.834	11.610
After test, weight of coke.....	13.713	11.243
	0.121	0.367
Percentage of loss.....	0.88	3.16

It therefore seems to be conclusively proved that if a coke of over 74 per cent hardness is used very little loss occurs at the top of the furnace, but if a coke of below 74 per cent hardness is used the loss may be very considerable.

The three photomicrographs were taken of picked specimens of coke and subjected to the tests attached to them. They analyzed:

	Hard Coke	Soft Coke	Very Soft Coke
Ash	13.7	12.9	12.50
Sulphur	1.31	1.22	1.16
Hardness	75.67	68.08	54.48
Percentage of water absorbed by dry coke	30.49	39.26	51.09
Percentage of loss when heated to red- ness in a current of CO_2 for two hours, 750 deg. C. (1382 deg. Fahr.)	5.40	7.01	9.70

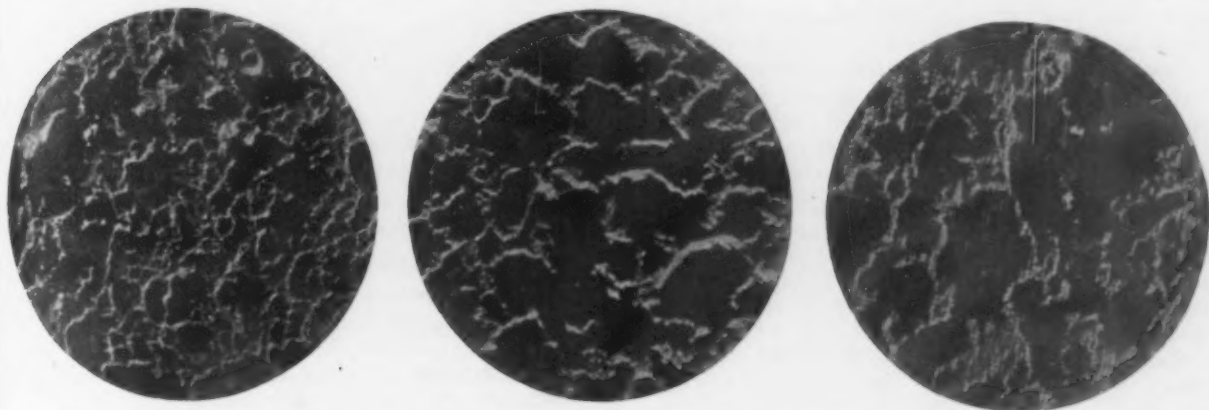
Again a soft coke is usually very friable, and unless the ovens are situated close to the blast furnace, so that

coke coming down, we had no further trouble with the drawing off of the slag. This has occurred more than once. A low coke consumption cannot be expected when the coke loses some 10 or 15 per cent of its weight within two or three hours of being charged into the furnace, and on arriving near the tuyeres is in the form of dust so finely divided that it actually obstructs the passage of the blast and the tapping of the slag.

On the other hand, when a hard coke is being charged, there is only a very small loss at the furnace top; the lumps of coke are larger and less friable, with the result that the burden is kept open and the blast passes through the furnace with a minimum of resistance, so, when the coke reaches the tuyeres, there is a considerable body of carbon left to be reduced by the blast, and the gases evolved therefrom are consequently operative on all the materials in the furnace from the tuyeres to the throat.

It is noticeable that when a soft coke is being used the waste gases are very rich in CO , and the ratio of CO to CO_2 by weight is consequently low, whereas when a good hard coke is being used the CO is less and the ratio consequently considerably higher. This is, of course, explained by the greater ease with which the CO_2 in the ascending gases attacks the carbon of the coke when it is soft, and which action the harder coke is able to resist in a much greater degree.

As to the crushing of the coke in a blast furnace, it is obvious that hard coke will offer greater resistance to a crushing stress than a soft one, but Charles Cochran always said, when his huge furnaces were criticized and the possibility of crushing of materials was mentioned, that "The crushing effect in a blast furnace can never be very great, owing to the fact that the



Hard Coke (Left) with a Hardness of 75.67; Soft Coke (Center) with a Hardness of 68.08 and Very Soft Coke (Right) with a Hardness of 54.48 Per Cent

the minimum of handling is thereby assured, it usually reaches the furnaces in a much smaller form than is the case with hard coke, consequently a greater area is exposed to the action of the gases as soon as it is charged into the furnace. I am referring to furnaces with comparatively small makes, as when a furnace is making 700 tons a day, as many are in the United States, a smaller coke is necessary, but it must still be hard. Having therefore commenced its passage through the furnace in a small state, it is allowable to imagine it becoming very finely divided before reaching the melting zone. In support of this theory I cite the following experience at the Ormesby furnaces:

Trouble had been had at one of the coke-oven plants from which our coke supplies came, and the coke that was being charged into the furnace was soft and friable, and altogether very bad. The furnaces struggled along for a few days, gradually driving slower and slower, until the coke commenced to improve; but, owing to the poor coke, the drivings of one of the furnaces had become so slow that we feared she was commencing to hang, as we could not get the slag to run, so, taking out the front tuyeres, we blew forward for a while to try and clear the forepart. This solved our troubles, for on commencing to blow forward great clouds of fine coke-dust were blown out, and when this ceased the front tuyeres were replaced, and the furnace commenced to drive again quite freely and, with the better

theory of the angle of thrust is equally applicable to a blast furnace as it is to a grain elevator."

Since the blast-furnace manager in most cases is more or less in the hands of the manager of the coke ovens, it behooves him to try and make the managers of coke ovens produce and send him a hard coke. Doubtless it can be done by "stamping," but there are not many plants in this country fitted with that device. I do not think it is necessary to produce a coke of greater hardness than, $76\frac{1}{2}$ per cent for conditions such as I have taken as normal, although greater hardness means a larger margin of safety.

Shortage of Tin Plate in Australia

The question of obtaining a sufficient quantity of tin plate to meet the requirements of Australian meat canners and jam manufacturers and others has become so serious that the question of manufacturing tin plate in Australia is being considered, according to U. S. Consul General J. I. Brittain, of Sydney. In some instances dry foodstuffs have been packed in containers made from cardboard, but at present there is a shortage of cardboard, owing to the inability to obtain sufficient raw material. One jam manufacturer, who has completed contracts for 7,000,000 lb. of jam, was obliged to suspend 400 hands owing to the shortage of tin plate.

Minimum Turnover in Machine-Shop Labor

The Principles Which Have Guided the Bullard Machine Tool Co. in Its Labor Policy and Wage Classification Plan—Results in Output and Esprit

BY STANLEY H. BULLARD

[The maxi-pay system of the Bullard Machine Tool Co. was described in *THE IRON AGE* of June 28, 1917. So much interest has been shown in the good results secured by the plan that Mr. Bullard was asked to describe the labor policy of the company, which has resulted in reducing the turnover of the skilled and semi-skilled workers (95 per cent of the organization) to less than 2 per cent a year in a city noted for its intense competition for such labor and for the unusually high wage rates paid for skilled toolmakers and machinists.—EDITOR.]

To convey a comprehensive idea of the changes which have been brought about in our plant, we will go back and outline the situation which we faced in 1914, and the plans which we developed to meet the conditions which began at that time and which in the meantime have undergone a revolution.

Industrial and commercial America suffered a severe shock at the outbreak of the European war. Business which had been normally fair for a period of years was staggered by the blow, and until the financial world caught its breath and obtained new bearings it was inevitable that the industrial world should stand still, as demand for manufactured articles and in turn the demand for the means of manufacture stood still. Suddenly it dawned upon the Allied and neutral world that the great war could not be carried on without mechanical means and the demand for mechanical equipment rapidly grew to proportions far in excess of the normal demand which had been enjoyed prior to the outbreak of hostilities.

Competitive Bidding for Workers

Plants for the production of munitions, involving the expenditure of fabulous sums of money, sprang up here, there and everywhere. The munitions plants required enormous quantities of machinery and the equipment plants were suddenly deluged with orders; the demand for mechanical skill for the production of this large volume of material became intense. With the starting up of the munitions plants came an increasing cry for mechanical skill, for equipment without operatives was useless, and during this period, which developed in the spring of 1915, the natural unrest of labor was greatly intensified by the competitive bidding for men on the part of munitions plants. Many of these concerns had contracts at apparently fabulous prices, which appeared to offer an opportunity for the payment of unheard-of wages.

Men employed by munitions contractors were sent broadcast to the machine equipment making plants to recruit munitions making forces from the mechanics there employed. The equipment manufacturers having contracts with specified delivery dates were sorely vexed, as they knew that the process employed by the munitions makers was on a par with the old plan of robbing Peter to pay Paul, and that in the end neither equipment nor munitions could be produced.

During this period the demand for Bullard product required a large increase in productive capacity; in fact, from a nucleus of 200 on Jan. 1,

1915 (about one-third our normal force), we had increased our force during the year 1915 to approximately 1500. The turnover was great, but perhaps not greater than in other plants similarly situated; in fact, we have reason to believe that it was to a certain extent less, for we were fortunate in having an initial organization which was intensely loyal and made up of men of long standing connection with us.

That this turnover could not continue if deliveries were to be met and Bullard quality maintained, was a foregone conclusion, and at about the middle of the year 1915 we addressed ourselves to a solution of the problem, reaching, after much thought, the following basic conclusions:

1. Rapid production and maintained quality are dependent upon skill and acquaintance with the work to be performed.

2. The manufacture of repetition work, to be in fact repetitive, must be repeatedly performed by the same man.

Therefore, to increase productive capacity was not merely a problem of increasing the number of operatives, but rather one involving the retention of operatives and increasing their skill and ability through a constantly growing familiarity with the work in hand and the upbuilding of team work and co-operation.

Effort Centered on Retaining Labor

Under the conditions outlined above, to attain this objective seemed extremely difficult and our entire energies were bent to a solution of the problem of *retaining* labor. Analyzing the situation, we concluded that there were certain definite, fixed principles on which alone satisfactory relations between employer and employee might be based and which would assure stability of labor and true efficiency of production. The principles evolved are:

1. That respect and confidence between employer and employee shall be established and maintained.

2. That a proper and equitable incentive must be provided for both.

3. That there must be established a measure for determining a rate of wage.

4. That the rate of wage must be definitely related to the energy, skill, experience and knowledge required to perform the work.

Having established our basis, which we believe the reader will agree is in every sense equitable, the steps taken to apply each principle and obtain a definite return from its application are in themselves quite interesting, and instructive as well, and will be elaborated upon in their order.

Mutual Respect and Confidence

Primarily, and as the result of years of association and co-working, we had the advantage of mutual respect and confidence in the nucleus around which our new organization has been built. And as a little yeast will leaven a large loaf, so in time we developed a proper spirit throughout the entire organization, hastening the ultimate end by special effort in demonstrating the working out of our policies.

A salient feature of this propaganda was the establishment of well-intentioned and eminently well carried out welfare work, in connection with which, as a conservation measure, was established a system of first-aid care of accidents, which was later extended to include the entire rebuilding and healing process in logical sequence. As a corollary to this work, and to further conserve the energy of the members of our organization, we installed a system of medical supervision and direction, employing for this work one of Bridgeport's foremost medical men, and we now have under consideration the question of still further extending this work to include dental, aural and optical hygiene.

To relieve a member's mind of worry regarding financial difficulty for his dependents should he die, and to further cement the bond of connection with the organization, we have insured each and every member, the benefits increasing year by year until in ten years the respectable sum of \$1,500 is reached.

As occupational accidents covered by compensation insurance are by no means the greatest cause for interruption in earning capacity, we have enlarged our insurance plan and now have provided health and accident insurance providing benefits against accident and ill health not pertaining to occupation.

All of the above sociological work is without expense to the worker, and we are well satisfied that the cost involved is proving to be a wonderfully wise investment.

Our long established policy of promotion from the ranks has aided largely in obtaining the confidence of our co-workers. It is a well-known fact that chief executives have all "been through the mill," having each served his apprenticeship and learned his trade, and the various chiefs of departments and foremen are likewise a product of the Bullard school who through merit have earned the reward of promotion and advancement. In other words, the door of opportunity is open, and when advancement is to be made the reward will surely fall on a meriting member of the organization.

Proper and Equitable Incentives

For the corporation the incentive lies in the great demand for its product and the profit to be derived therefrom, provided manufacturing costs are kept within the bounds of reason and efficiency. For the worker, whose labor is directly applied to production, the incentive is high and is comprised of three separate and distinct units.

1. An hourly rate of wage bearing equitable relation to the energy, skill and knowledge of the individual as well as the unusual cost of living.

This is provided in the rates established by the Bullard maxi-pay system.

2. An incentive to prompt, regular and continued attendance; for only by promptness, regularity and continued application can the full benefit of employment or equipment be obtained.

The Bullard attendance bonus plan provides a means for reaping the reward of these cardinal qualities, adding 10 per cent to the regular weekly earnings if the simple requirements are abided by.

3. Closer application, with its accompanying increase of skill and the will to produce, merits reward commensurate with the resulting increased output.

The Bullard maxi-pay production bonus plan, based upon the allotment of an established standard

time for unit production, provides for the payment of an increasing bonus without limit, for increased efficiency and reduction of time required for the actual performance of the work in hand. The inefficient worker loses nothing except the opportunity for increased earnings and advancement and retention, as his established hourly rate is paid regardless of his calculated efficiency.

The Bullard maxi-pay production bonus plan is without question highly equitable to both the worker and the corporation, as the worker is financially rewarded for the extra effort and skill required in increasing production, and the corporation in its turn obtains an increased productive capacity from its plant and equipment and therefore an increased return on its investment.

Determining Wage Rates by Established Measures

The rate of wage is dependent upon individual productive capacity, the cost of living, and the question of supply and demand, individual productive capacity bearing a paramount relation to the others as it directly affects the cost of manufacture and therefore the saleability of the product in question.

Statistics bearing on the cost of living are nationally available. Data regarding supply and demand are a matter of plant record, as is information regarding the cost of the various classifications of labor applied to production and, in turn, the direct relation of labor cost to the sales price of the finished product.

To arrive at an intelligent conclusion by combining the factors evolved by the above analyses requires experience, judgment and above all an equitable mind. It is highly essential, however, that the hourly rate established shall be such as will produce in the worker a contented frame of mind.

The Relation of Wage Rate to Skill, Energy and Knowledge

Individual judgment is not infallible, and, as in the nature of things earning capacity must bear a direct relation to productive capacity, means must be provided for recording the individual's capacity for production and comparing by periods the improvement or decrease therein.

The Bullard maxi-pay wage plan is based on a classification of the various degrees of energy, skill, experience and knowledge, and in combination with the records of the maxi-pay bonus plan provides a means for determining the status of each member of the organization.

A comprehensive study of the problem has resulted in the establishment of standard rates of efficiency (a direct reflection of energy, skill, experience and knowledge) which will warrant promotion from one class to the next, with its attendant increase in hourly rate.

The Test of Results

The above statement of facts regarding our work must in itself be interesting; but without the capstone of proof of value it is not conclusive. As the proof of the pudding is in the eating, and as the measure of earning capacity lies in productive capacity, so the value of this work lies in its record of definite improvement. In this connection the following facts will prove interesting.

Labor turnover has been reduced practically to zero, particularly in the skilled and semi-skilled branches of the organization. Of the period intervening since the outbreak of the European war it can be stated without reservation or qualification that in the Bullard plant there has been no agita-

tion, no unrest and apparently no dissatisfaction, besides which in the two years ending with the first quarter of the year 1918, measured by identical machine units produced with identical equipment, the productive capacity of each plant hour has been increased 142 per cent, which fact, expressed in other words, means that to obtain present production under former conditions would require a plant approximately two and one-half times as large as the present, with all that is involved therein, including investment in buildings, equipment, etc., as well as productive force—this latter item presenting an extremely difficult problem to-day.

CHAIRMAN OTIS' PLANS

Tells What Is Being Done Through Organization of Manufacturers

Charles A. Otis, Cleveland, chairman of the regional industrial commission of the War Industries Board, appointed to classify and co-ordinate plants to increase production and readjust industry for war purposes, is a grandson of William A. Otis, who in 1840 established the first iron works of any importance in what was then the village of Cleveland, and a son of Charles A. Otis, who in 1852 erected a steam forge to make wrought-iron forgings and in 1859 added a rolling mill to manufacture merchant bars. He later organized the Otis Steel Co., which became a very important industry. The present Charles A. Otis was connected with that company for a number of years and afterward carried on a steel commission business in Cleveland. In recent years he has been engaged principally in dealing in stocks.

In an interview with James B. Morrow, a Washington journalist, and published by the Cleveland *Plain Dealer*, Mr. Otis gives at some length his idea in regard to present conditions and the work that he has undertaken:

Mr. Otis said, in part:

"The war is to cost this nation \$24,000,000,000 during the Government year of 1919. It would be foolish strategy to attempt to spend most of the money in regions that are already swamped with work. Rush such regions to the limit, of course, and then let the overflow be distributed generally throughout the country.

"Now the section, to the management of which I have been assigned, has no power under the law. All that any of us can do is to discover the means and sources by which the national government can obtain the materials and weapons it needs.

"This we are doing through an organization of manufacturers that covers the country. Twenty regions have been outlined and in each there is a general committee and a number of subcommittees representing the industries in that particular division of territory.

"In every region there is one man with whom I am in direct and personal contact. He keeps me informed as to conditions in his region and is supposed to have an inventory of the manufacturing plants, large and small, within his district.

"I am following the plan that was adopted in Northern Ohio and am applying it nationally. In Ohio we have a reliable record of what is going on in such cities as Cleveland, Columbus, Toledo, Youngstown, Akron, Canton, Elyria and Lima.

"Intimate knowledge of conditions in all of the factories assured us that the Government's requirements could be met in one way or another.

"We hope to be equally as well informed with respect to every manufacturing region and town in the United States. The section of resources and conversion is to be the one national center of industrial information."

For the purpose of enabling enlisted men to secure training which will fit them for advancement in different branches of the Army, a training school will be opened at the Baltimore Polytechnic Institute, Baltimore, on Aug. 1.

The Bullard organization has proved itself a comprehensive and cohesive unit in filling its portion of the needs of the nation and, as our entire output since America's entrance into the war has been devoted to the manufacture of equipment for the three great national arms—the Navy, Army and transportation system—we feel that directly and in every sense we are in the nation's service. In order to proclaim this fact to the world at large, each member of the organization now wears a Bullard badge of honor, a gold medallion enameled in the national colors, bearing the Bullard trademark and the motto, "In the Nation's Service."

ACCIDENT PREVENTION

President Wilson Will Address Convention by Telephone, Mr. Schwab in Person

The seventh congress of the National Safety Council, which will be held at the Hotel Statler in St. Louis during the week of Sept. 30, will concern itself largely, if not primarily, with the work of accident prevention in the steel industries. This is indicated in the program of the convention that has just been issued by Carl L. Smith, secretary of the Central Mississippi Valley Division of the Safety Council, who is at St. Louis laying plans for the convention.

The long list of steel men on the program is headed by Charles M. Schwab, director of the Emergency Fleet Corporation, who will deliver the principal address at the opening session on "The Democratization of Industry." At this same session, President Wilson will be represented by Franklin K. Lane, Secretary of the Interior, who will speak on "Safety as an Asset in Winning the War."

H. F. Perkins, works manager of the International Harvester Co., Chicago, will follow the address of Mr. Schwab immediately after the noon intermission with a paper on "The Personal Problem in Industry." Dr. Thomas Darlington of the American Iron and Steel Institute, New York, will be the next speaker, his subject being "The Economic Value of Health of Industrial Employees."

The third session of the first day will take the form of a public mass meeting at which Secretary Lane will be the chief speaker and patriotism the dominating subject.

The second day's program will open with a general session, arranged primarily for the benefit of safety engineers desiring to familiarize themselves with the fundamental principles and methods of securing success in their work. Charles R. Hook, vice-president, operating division American Rolling Mill Co., will preside. The papers and their authors follow:—

The Real Problem of the Safety Engineer.—Charles R. Hook.

How to Organize for Safety.—Frank B. Morris, safety engineer, American Rolling Mill Co., Middletown, O.

Modern Methods of Safeguarding.—A. S. Rogula, United States Navy Yard, Brooklyn.

The Backing of the Manager and the Co-operation of the Foreman Indispensable to the Success of the Safety Engineer.—W. E. Worth, general superintendent Chicago Tunnel Co.

Tuesday afternoon a general round table discussion, under the direction of Chairman Philip Stremmel, general superintendent Granite City Steel Works, Granite City, Ill., will occupy the full time of the convention. Among the principal topics to be discussed will be "How to Get the Manager Interested in Safety" and "The Promotion of Community Interest in Safety as an Industrial Asset."

Tuesday, Wednesday, Thursday and Friday will be devoted to sectional meetings, where the delegates will gather to discuss problems of accident prevention peculiar to their calling or industries. An informal dinner will be held Wednesday evening, Oct. 2, a feature of which will be a five-minute address by President Woodrow Wilson over long distance telephone through the courtesy of the Southwestern Bell Telephone Co.

Milling Machine with New Type of Drive

A constant-speed driven type of milling machine, in which 16 changes of spindle speed and the same number of feed rates are available, has been brought out by the Cleveland Milling Machine Co., Cleveland. All of these changes are obtained through sliding gears controlled by two ball-joint type levers, the tumbler gear in the feed change mechanism having been eliminated. As is the common practice with this type of machine, the controlling levers have been centralized within easy reach of the operator. The column is cast integral with the bed, and the feed gearbox is mounted in the knee, thus eliminating a universal joint shaft for driving it.

The column is a rigid box section and together with the base forms a single semi-steel casting with heavy reinforcing ribs. As far as possible openings in the column have been eliminated, the only ones being two for the change gear levers at the front, the pulley drive housing in the rear and one for the cutter lubricant tank on the left side. It is pointed out that as all parts contained in the column are automatically lubricated and all adjustments for the bearings are made from the outside, it is unnecessary to open the column. The knee slide, which is a dovetail section, extends to the square overarm, thus providing a surface for clamping attachments, and this form of construction, it is pointed out, eliminates the taking of the heaviest pressure at the thinnest section of the wall. In addition to the reinforcing ribs, the column is divided by horizontal and vertical walls to separate the oil employed for lubricating the machine from the cooling compound used on the cutter, an arrangement that provides additional reinforcement as well. The base, which is also ribbed, is pan shaped to catch the surplus oil and the chips produced by the cutter and thus keep the space around the machine clean.

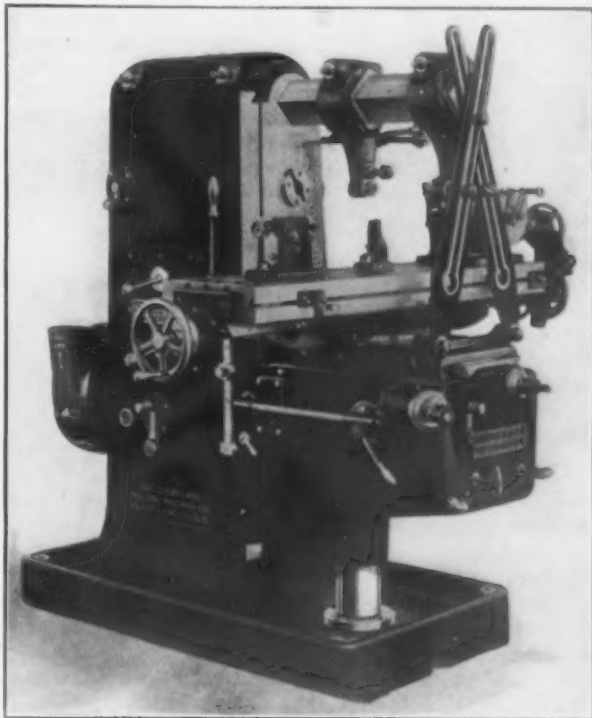
The bearing of the knee upon the column is on a flat, wide surface, the narrow slide of the dovetail bearing acting as a guide only. There is also no bearing in the center of the dovetail slide, an arrangement which is relied upon to eliminate any chance of the slide being marred by the operator laying tools on the upper surface of the knee. The bearing of the knee on the column is carried well above the top of the saddle slide, which tends to give the knee a longer bearing on the column as well as reducing the bearing pressure. A large-diameter one-piece elevating screw is employed to adjust the knee, the screw being operated through a double bevel gear. A post, which acts both as a support to the elevating nut as well as a guide in the knee, is employed and has eliminated the telescopic screw usually provided. The feed change gearbox is entirely inclosed, this arrangement being relied upon to prevent chips from getting into the feed mechanism on the inside of the knee. Hand and power feed, both independent of each other, are provided.

The table is machined all over with a view to keeping it in alignment, and the bearings on the table are at the top of the saddle instead of at the bottom of the dovetail. It is pointed out that this arrangement gives a large bearing surface and locates the bearings, which are automatically lubricated by rollers in the saddle well apart. The bearing on the saddle is also at its widest portion, and both saddle and table bearings have long taper gibs with adjusting screws at both ends to take up the wear.

A single square overarm is employed which is relied upon to provide positive alignment of the arbors and great rigidity of the arm pendants. In this way, it is pointed out, it is possible for work to be placed on the table and fed in a vertical position past the overarm, while it is also practically out of the question for the operator to place the arbor supports on the overarm and on the arbor except in the proper alignment. Another advantage claimed for this construction is that a great variety of work can be handled due to the firmness resulting from the use of a square section.

A flanged spindle is employed which eliminates the end overhang as well as likelihood of the cutters screw-

ing fast and permits the cutters to be run in either direction. A face keyway into which hardened steel jaws are inserted for driving the arbor as well as the face mills is provided. When changing from a face mill to an arbor, it is explained, it is unnecessary to remove these jaws since they do the driving and the strain is therefore removed from the taper hole. A positive lock that enables the operator to loosen the arbor nuts



A Driving Pulley Running at a Constant Speed and a Drive in Which Loose Gears on the Spindle and Tumbler Gears in the Main Drive and Feed Change Mechanism Have Been Eliminated Are Features of a Newly Developed Milling Machine

easily is provided as well as a handwheel for revolving the spindle for boring and other milling operations. It is pointed out that the spindle lock cannot be operated while the machine is running nor can the main driving clutch be engaged while the spindle lock is loosened. Sliding gears controlled by two conveniently located levers provide for 16 spindle speeds in either direction.

The power is transmitted through a single driving pulley operating at a constant speed and loose gears on the spindle have been eliminated, all the shifting of gears being done on secondary shafts underneath. The tumbler gear has been eliminated in both the main drive and the feed change mechanism. The driving pulley is protected by a belt guard and can be adjusted to any desired angle, while it is also possible to add extensions to it. The starting lever can be operated from both sides of the machine and the mechanism for reversing the direction of the rotation of the spindle is contained within the machine, thus enabling either right or left hand cutters to be used without the necessity of bolting any driving mechanism on the outside of the column or the knee.

Automatic flood lubrication is employed for all of the bearings and gears in the column and the knee, thus eliminating the necessity for having oil holes in any of these members as well as relieving the operator of the responsibility for lubrication. The oil reservoir has sufficient capacity to run for approximately six months on a single filling. A pocket for cooling lubricant for the high-speed steel cutters used is provided and a centrifugal pump which operates only when the spindle is revolving is used to circulate this compound. It is, therefore, unnecessary to stop the cooling compound system when work is being changed or measured, as the pump operates automatically when the clutch is thrown in to start the machine and stops when it is disengaged.

Liquid Ferromanganese in Steel Making

Advantages Over Using the Solid Alloy —Type of Melting Furnace—Cost and Savings by One American Steel Maker

VERY little has been done in the steel industry of the United States in pre-melting ferromanganese before adding it to the molten steel. This is especially true when the situation is compared with practice in other countries, particularly Germany. The advantages of this practice and the recent experience of one American company were recently made public by E. C. Hummel of the United Alloy Steel Corporation, Canton, Ohio, who is in charge of the electric alloy melting furnaces, plant B, of that company. Mr. Hummel writes:

The practice of adding ferromanganese to the steel bath for the purpose of reducing it, instead of the generally employed method of using solid ferromanganese, was first instituted in Germany. Because of the several advantages of this practice a number of their works have adopted it. They enumerate these advantages as follows:

An appreciable direct saving in ferromanganese.
The steel is more uniform.
The time of the heat is shortened.
The temperature of the heat may be kept lower.

For very obvious reasons, they have chosen to melt the ferromanganese in electric furnaces and have used, throughout 11 of their works, five different types of such furnaces. Regarding the respective merits of these furnaces we are not concerned. But in view of the fact that the above claims have been made, it may be interesting to know the experience and observations made by one steel company in this country which has for the past several months been using liquid ferromanganese in connection with one of its open-hearth plants.

The Electric Furnaces Used

Before taking up the discussion as to the relative merits of the practice, some data and information concerning the operation of the electric furnaces used will be given. As these furnaces are exactly similar and are operated in the same manner, figures pertaining to one furnace will be sufficient to give an idea relative to lining, costs, capacity, etc. These furnaces are of the single-phase, bottom-electrode type and are run on a basic lining. A bottom of burnt magnesite is sintered in. There seems to be a question regarding this in the minds of some operators of this type of furnace, believing that the water-cooled bottom electrode cannot be used to form an arc with the top electrode on account of melting too easily. Directly, that is a fact. However, by making a few adjustments and using the bottom electrode as a part of the circuit instead of a terminal, this difficulty is overcome, and a bottom of any depth may be sintered in. At the time of this writing (April) over 400 heats have been tapped from such a lining, extending through an operating period of nearly 20 weeks.

The furnaces just described are one-ton furnaces. The size of the charge usually depends, however, upon the amount of ferromanganese ordered by the open-hearth melter. It is not unusual to melt five tons of ferromanganese in a period of 24 hr., this meaning from 6 to 11 heats, depending upon manganese specifications. The average time required to melt a ton of ferromanganese and have it in shape to tap is about an hour and a half. However, several factors enter in this interval of time which materially affect it. They are as follows:

Size of the ferromanganese charged.
Temperature of the furnace at the time of charging.
Shape of the electrode.

Fine ferromanganese or large lumps do not melt as readily as pieces about the size of an apple. A thin-pointed electrode nearly doubles the time required to

melt a charge. The temperature of the furnace at charge is important, as a cold furnace absorbs heat which otherwise would appear in the bath. In considering the quantity of ferromanganese melted in a 24-hr. period, it must be remembered that the melting furnace is constantly working under a certain disadvantage in this respect. The open-hearth heat may come faster or slower than the melter anticipates when he orders the liquid ferromanganese. This may find the electric furnace not ready to tap or else require it to hold the heat. Or the open-hearth heats may not be scattered, tapping at such periods that it is impossible to supply all of them.

These occurrences are almost daily and have the greatest influence on the quantity of ferromanganese melted per 24-hr. period, because they determine the interval between heats. For that reason striking an average time through several 30-day periods, including delays for repairs, a heat is tapped about once every four hours. Any necessary repairing to electrical equipment, water piping or hearth is usually made in the interval between heats, so that an absolute shut-down for any length of time is not required. Under such conditions practically continuous operation can be maintained, as the furnace at no time has required extensive repairs.

Cost of Pre-Melting

The following items pertaining to the melting cost of ferromanganese are based on actual operation, extending over an interval of four months in which an average of 70 tons were melted during each 30-day period:

Labor	\$8.55 ton
Power	9.55 ton
Electrodes	3.00 ton
Refractory cost	2.90 ton
Repairs to mechanical and electrical parts..	1.22 ton
	\$25.22

These data were not considered under the most favorable conditions, but are simply an average taken over the first four months of actual operation. It goes without saying that the above is daily being improved upon, and it is the writer's opinion that a figure as low as \$15 to \$20 will soon be reached.

The crew on both shifts consists of a melter and two helpers. The work done by them includes all pit labor, the supplying of ferromanganese, as well as all necessary furnace repairs. It has been found that the results are better by employing two helpers than depending upon the yard labor gang for incidental work, and using only one helper.

The power consumption per ton varies between 900 and 1400 kw.-hr., depending upon the length of time the heat is held in the furnace. The closest co-operation is required with the open-hearth in order to keep this as low as possible. The power factor is about 70 per cent under normal load, operating at 90 volts. [It is well known that all arc furnaces running on a poly-phase current on a solid bottom have a power factor of about 90 per cent.—Ed.] The design of the furnace accounts for the low power factor. Assuming normal load at approximately 5000 amperes and taking the tapping temperature at 2850 deg. Fahr., an average efficiency of nearly 50 per cent is approached.

Kind of Electrode

An 8-in. amorphous carbon electrode is used, as better results are obtained in this work than by using a 6-in. graphite electrode for which the furnace was designed. In a furnace of this type and size the umbrella effect produced by the arc must be considered, as the life of the roof is materially affected by it. This effect depends entirely upon the cross-section of the

electrode at the place where the arc is struck. The 8-in. amorphous carbon does not become pointed as soon as the 6-in. graphite, which advantage decreases the time of melt, neither is the breakage loss as high. The electrode consumption averages 33 lb. per ton, which includes the stumpage loss.

The refractory cost is dependent entirely upon the prevailing furnace practice. In this work, it is most advantageous to use a thin coke and silicon slag, which reduces the tendency of the ferromanganese to oxidize and at the same time protects the roof and sidewall. However, the main refractory cost lies in the relining of the roof, 70 to 100 heats being obtainable on one lining. By using a simple 10-in. jacket cooler on the roof, the life of the roof is lengthened and excessive heating of the electrode prevented.

Saving in Alloy Needed

In discussing the practice of adding liquid ferromanganese to the steel bath, the one outstanding advantage is the direct saving in the quantity of the ferromanganese used per ton of ingot. Figures submitted by the metallurgical department show this to vary from 5 to 30 per cent, depending upon the kind of steel being made. Considering the present and recent market prices of ferromanganese, the saving has been from 20 to 75c. in the cost per ton of ingot produced. However, it is not wise to attempt to carry this saving too far. It must be remembered that the liquid ferromanganese is poured into the ladle while the metal bath is being tapped and the time allowed for reducing the steel is very short indeed.

When working with solid ferromanganese it is usual to wait about five to eight minutes after the addition before pouring it into the ladle so as to give the ferromanganese sufficient time for reduction. When putting the liquid ferromanganese into the ladle, this time is shortened, with the result that a higher output is obtained. If the quality of the material produced is influenced by insufficient reduction, this increase in output is then an expensive thing. No bad effects have been found in the quality of the material, but rather an improvement, while the saving in ferromanganese and time has been pronounced. Concerning the temperature of the heat, there is no difference in either practice.

The question now arises as to what effect the return of ferromanganese to its normal cost in the future will have on the successful carrying on of this practice. The saving in ferromanganese will still go on, but its appreciable effect in reducing the cost per ton of ingot will be materially lessened. However, by that time the melting cost, due to experience and co-operation, will be lowered to a degree which it is hoped will strike an even balance.

This subject was also discussed by Joh. Harden of Stockholm, Sweden, in an article in *THE IRON AGE*, April 11, 1918, entitled "Using Manganese Ore and Alloys in Sweden." Mr. Harden discussed the kind of furnace used in Sweden and Germany for pre-melting the alloy and emphasized the superior quality of the steel obtained from this practice. He cited comparative tests which showed a saving in manganese of 44.3 per cent by adding the alloy in the liquid state as compared with adding it solid.

New Koppers Coke Ovens at Steelton

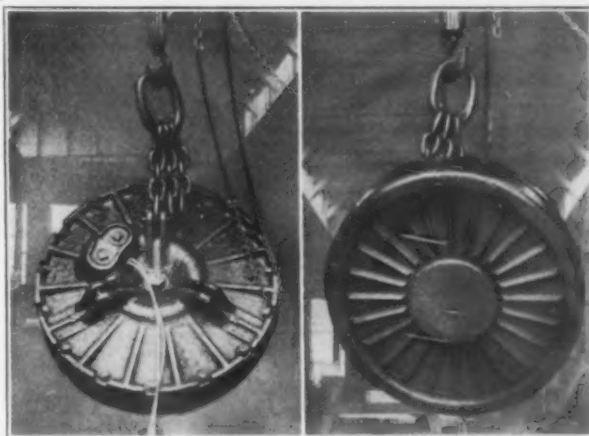
At the Steelton, Pa., plant of the Bethlehem Steel Co. a new battery of 60 Koppers by-product coke ovens was put into operation July 9. The H. Koppers Co. of Pittsburgh began the construction work in November, 1916. The ovens have an individual capacity of 12½ tons each, with a combined output of 700 net tons of coke per day of 18 hours coking time, or 1000 tons on a 24-hour day basis.

The Thomas Furnace & Iron Co., Easton, Pa., is making improvements at its Hellertown furnace, and is planning to place the plant in full operation at an early date.

New Type Steel Mill Lifting Magnet

A new mill type of lifting magnet has been brought out by the Ohio Electric & Controller Co., 5900 Maurice Avenue, Cleveland. The magnet, while it conforms to the accepted and generally considered most efficient standards of construction, possesses several detail features calculated to eliminate what have been the most frequent sources of operating trouble.

It is stated that the most serious and expensive troubles in operating magnets are grounds, open ends, and short circuits, due to the loosening of the internal



Welding the Connections and the Use of Asbestos Insulation Are Relied Upon to Eliminate the Troubles Due to Grounds, Open Ends and Short Circuits Resulting from Vibration in a New 50-In. Lifting Magnet for Steel Mill Service

screw and nut connections caused by the severe vibration and jolts to which lifting magnets are subjected. These troubles are eliminated in the Ohio magnet by the use of welded connections and asbestos insulation.

Another trouble in the operation of magnets which is said to be the next most serious to those named above is the breakage and loosening of bolts, causing finally the breakage of the outer rings which are called renewable rings for this reason. To eliminate this trouble, the Ohio magnet is over 8 in. high and is secured by a heavy chrome vanadium steel stud with nuts on the top of the cast steel case, these nuts being protected by ribs raised on the outer rim of the case.

Other improved features claimed for the magnet are minimum headroom, ample copper in the coil, heat radiating ribs at the top and bottom and flexible armored leads anchored in the case and welded directly to the coil.

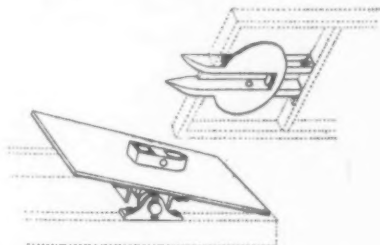
Work at Neville Island Plant

Active work is now going on in the building of the Neville Island gun and projectile plant of the Ordnance Department, United States Steel Corporation, Neville Island, Pittsburgh. More than 500 laborers are at work, and in order to house these men there will be built 12 barracks, and as the number of men at work increases more barracks will be built. The committee of 10, which has in charge the building of this plant, was in session in the offices of the Ordnance Department in the Union Arcade Building, Pittsburgh, for several days last week, going over the plans. The main work being done now is filling along the back channel of the Ohio river, where nearly 100 cars of slag per day are being dumped in order to form the triple roadway on which the highway, railroad lines and street car tracks will be built. The barracks to be erected will embrace the latest military ideas in equipment and structure. It is said that more than 2000 houses will be built on the hills, almost south of the plant, for homes for workmen. However, definite plans about these have not been made.

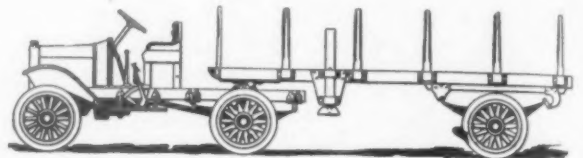
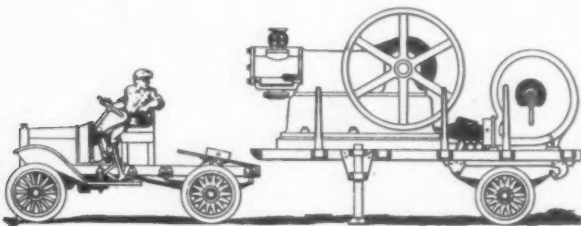
Joseph Beal & Co., Boston, dealers in machinery, have opened a new store at 25 Purchase Street, that city.

A Fifth Wheel Trailer Control

A device which is designed to increase the use of tractors and semi-trailers in the field of industrial transportation has been brought out by the Borst Coupler Control Mfg. Co., Buffalo. It is a combination controlling and coupling mechanism, enabling the driver to control the semi-trailer while backing into any position without moving from his seat. In connection with the coupler control a carrier brake is employed to hold the trailer at the proper height for the tractor unit to back in and couple. This is designed to take the place of jacks and brakes, and can be lifted out of the way whenever the tractor is coupled to the front end



A Special Fifth-Wheel Trailer Control and Coupling Device Facilitates the Use of Tractors and Semi-Trailers in Industrial Haulage



A Trailer Supporting Member Is Employed to Hold the Load at the Proper Height for Coupling and Can Be Lifted Out of the Way when Not in Use

of the trailer preparatory to moving the load it carries.

The trailer control is attached to the lower part of the coupler and it is emphasized has practically no wearing parts and can easily be operated by the driver through a pedal mechanism. This is attached to the frame at the side of the driver's seat and makes it possible to control the action of both the tractor and the trailer, thus making both parts work as a single unit. It is explained that while a heavy load could be transported economically on a straight haul by the use of a tractor and semi-trailer, when the driver endeavored to back the tractor and trailer into any desired position, difficulties were encountered and part, if not all, of the time gained in the use of the tractor and trailer were lost, since time, patience, skill and labor were required to maneuver the trailer into the desired position.

The fifth wheel platform or turntable is built substantially with heavy iron on its upper surface, to permit a sliding movement between the tractor and the trailer under heavy loads. The upper half of the fifth wheel coupler is constructed of two sliding members fastened to channel iron and supported on the bottom by a turntable plate. These channels, it is explained, are long enough to make a bolster and can be attached to any make of trailer or wagon easily.

In conjunction with the trailer control an arrangement is provided by which the use of jacks or trailer hoisting mechanisms is eliminated. This is known as a carrier brake and is employed when the trailer is free from the tractor to hold the former at the desired level. After the coupling has been made between the tractor and the trailer, the carrier brake is raised so as to be out of the way when the trailer is being hauled.

War taxes assessed against the Youngstown Sheet & Tube Co., Youngstown, Ohio, amount to \$16,188,854.24. This amount, deducted from the 1917 net earnings reported at the annual meeting in February, leaves an actual net for the year of \$14,365,459, available for surplus. During the year the company disbursed in dividends \$4,394,721, which, added to the earnings placed in the surplus fund, makes a total net for the year of \$18,750,180.

The Crescent Truck Co., 347 First Avenue, Elizabeth, N. J., has purchased all rights, title and interest to the Crescent electric industrial truck from the Moore Plant of the Bethlehem Shipbuilding Corporation. A full line of trucks and tractors is being built.

New Child Labor Bill

WASHINGTON, July 23.—A measure designed as a substitute for the child labor law, recently declared by the United States Supreme Court to be unconstitutional, has been brought forward in the Senate by Senator Lenroot of Wisconsin. While a member of the House, Mr. Lenroot was actively interested in securing the passage of the original child-labor law, and he regards it as important that the fatal defect in the statute pointed out by the Supreme Court should be remedied at the earliest practicable date.

The Supreme Court held the child-labor law to be unconstitutional because it interfered with the exercise by the States of their police powers.

Mr. Lenroot's bill is based on an entirely different principle. A condition that cannot be reached by a direct Federal prohibition he proposes to control through the exercise of the undeniable right of the Federal Government to impose internal revenue taxes. The chief provision of his bill prescribes that "every person operating (a) any mine or quarry situated in the United States in which children under the age of 16 years have been employed or permitted to work during any portion of the taxable year; (b) any mill, cannery, workshop, factory, or manufacturing establishment situated in the United States in which children under the age of 14 years have been employed or permitted to work, or children between the ages of 14 and 16 have been employed or permitted to work more than eight hours in any day or more than six days in any week, or after the hour of 7 p. m. or before the hour of 6 a. m., during any portion of the taxable year, shall pay for each taxable year, in addition to all other taxes imposed by law, an excise tax of 5 per centum upon the entire net profits received or accrued for said year, from the sale or disposition of the product of such mine, quarry, mill, cannery, workshop, factory, or manufacturing establishment."

The Lenroot bill has been referred to the Committee on Finance and inasmuch as it provides for the taxation of individuals, partnerships, corporations, etc., an effort will be made to have it attached to the new revenue bill when that measure is received from the House.

The Bureau of Oil Conservation, Oil Division, United States Fuel Administration, Washington, is desirous of securing a combustion engineer for each of the following districts, who will act as an inspector visiting all plants within his district using fuel oil and natural gas: Boston, Providence, New York, Philadelphia, Pittsburgh, Buffalo, Detroit, Chicago, Minneapolis, Tulsa, New Orleans and San Francisco. It is desirable to have these men act as volunteers where possible, but the Administration is prepared to pay a reasonable compensation for men who cannot afford to give their services to the Government. Only men who have had experience in fuel oil and natural gas combustion would be of value.

The Standard Pressed Steel Co., Philadelphia, has moved its general office and business departments to the corner of Indiana Avenue and Twentieth Street, that city.

CHROME ORE IN CALIFORNIA

Growth of Mining Operations—Novel Truck to Transport Ores

The United States imported about 74,000 gross tons of chrome ore in 1914, about 76,000 in 1915 and about 115,000 tons in 1916, according to Government statistics. The normal domestic consumption of this ore is around 70,000 tons yearly, which has formerly been imported principally from New Caledonia, Rhodesia and minor sources. In 1915, and more especially 1916, domestic production of chrome ore was taken up seriously and in the latter year California, practically the only producing state, shipped roughly 25,000 tons to the Eastern markets.

In 1917 Oregon shipped small quantities, so that with California the home production exceeded 30,000 tons. Demand this year, with the need for shipping excluding foreign importations, has made the price attractive enough to develop large ore bodies in the West which hitherto were too isolated to work profitably, especially in the mountainous regions where many miles of road had to be built in order to transport the ore to railroad points.

The present demand for chrome steel has increased tremendously both the price and the manufacture of ferrochrome. This has not only led to the opening up of new chrome ore properties in California and Oregon, but has developed the use of many concentrating plants for increasing the chromic oxide content in low grade ores to a marketable point. There are many chrome ore deposits, especially in California, that contain from 20 to 25 per cent Cr_2O_3 , which are too low grade for commercial uses. As the chromite has a higher specific gravity than the gangue, it is easily concentrated and there are over 50 concentrating plants in California turning out a product from 38 to 50 per cent ore.

For the manufacture of ferrochrome some manufacturers have set their minimum specifications at 35 per cent. Ore as low as 30 per cent is used, however, for refractory purposes and in open-hearth furnaces. In the manufacture of chrome brick 40 per cent ore is demanded and for chemical purposes most manufacturers demand 45 to 55 per cent ore.

The most fertile fields in the West for chrome ore are in Del Norte County, Cal., which, according to R. D. Adams and C. S. Maltby, the main operators there, will produce a minimum of 20,000 tons this year. This is one of the very few counties in California that has no railroad and the ore has to be hauled in motor trucks to Crescent City, a Pacific Coast port, and there transported by boat to either Eureka or San Francisco, which have railroad terminal facilities.

Grant County, Oregon, according to these operators, will be the next largest producing county in the West, and the estimated production there is from 10,000 to 15,000 tons. Many other counties in California will produce from 2000 to 5000 tons, making a possible total production from the United States of close to 100,000 tons. With the development that is now going on, it is believed enough chrome ore can be produced to take care of the normal demands at home for several years to come.

Prices being paid at present range from \$1.25 per unit for each unit of chromic oxide contained on a 38 per cent quality ore, to \$1.75 per unit for 50 per cent

ore, or better. On the lower grades 90c. to \$1 per unit is paid for 30 per cent ore with a bonus of 5c. for each additional unit over 30 per cent.

Some of the chrome ore producers in the West are establishing themselves permanently in the business and some novel trucking devices have been developed. Illustration shows a specially built Ford truck, the tread of which has been narrowed to 42 in. and a four-speed transmission installed. The complete outfit costs a trifle under \$1000, and they are now in operation on the Adams and Maltby property in Del Norte County, Cal. Operating costs approximate 15c. per ton mile, and they can travel easily with a 2½-ton load on a five-foot road, which cuts the initial road building costs in two compared with a standard tread truck.

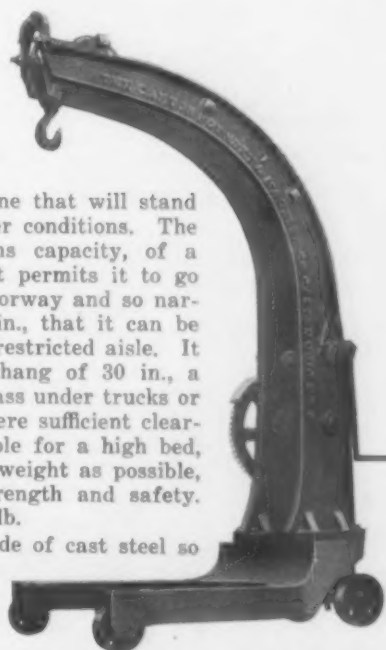
A Portable Crane for Unloading Cars

A portable crane designed especially for use by manufacturing plants in loading and unloading cars and in railroad freight station work has been brought out

by the Canton Foundry and Machine Co., Canton, Ohio. For loading freight cars a crane is required that can be handled with safety by unskilled labor and one that will stand all kinds of weather conditions. The crane is of 2 tons capacity, of a height, 78 in., that permits it to go into any boxcar doorway and so narrow in width, 32 in., that it can be pushed through a restricted aisle. It has a liberal overhang of 30 in., a low bed that can pass under trucks or in other places where sufficient clearance is not available for a high bed, and is as light in weight as possible, consistent with strength and safety. The weight is 740 lb.

The base is made of cast steel so that the crane will stand severe service. It is stated that a cast-iron base is very likely to crack or break under the severe strain when used

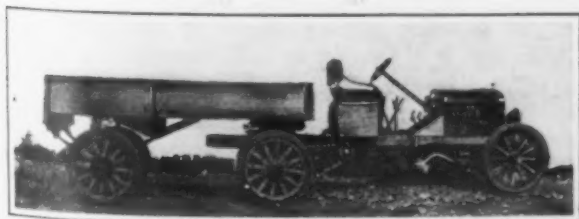
outdoors in zero weather and that a base made of angle iron when subjected to strain or when a load is dropped on it is almost sure to bend. The housings are of semi-steel reinforced with a wrought iron band. The wheels have roller bearings. Such parts as the axle, fork and yoke are drop forgings.



A New Portable Crane for Manufacturing Plants Is Low Enough to Pass Through a Boxcar Doorway and Is Sufficiently Narrow for Use in Restricted Factory Aisles

St. Louis is expected to play a prominent part in the Government's plans for the establishment of barge line traffic between New Orleans and St. Louis. Following a conference between a committee from the St. Louis Chamber of Commerce and M. J. Sanders of New Orleans, a newly appointed federal manager of the Mississippi River transportation project, it was announced that the steel barges necessary to the enterprise probably will be built at St. Louis. A definite announcement regarding the matter is expected in the near future. Eight million dollars will be spent for barges, docks, elevators and ship-loading machinery.

The Curtiss-Willis Co., 30 Church Street, New York, has originated a new way of using thrift stamps. It is sending out many letters, to each of which is attached a 25-cent thrift stamp with these words above the stamp: "Paste this on your card. It will help lick the kaiser."



The Trucking Device Used in California to Transport Chrome Ore to the Railroads. It is a Ford, the tread of which has been narrowed to 42 in. and a four-speed transmission installed.

SUPPLIES OF FERROMANGANESE

Domestic Output at Record Heights—Available Supplies—Spiegeleisen Production

Striking records have been made in the domestic production of ferromanganese since the last review of the status of this industry was published in THE IRON AGE, April 11, 1918. That statement covered the output for the first quarter and showed the March output to have been next to the largest ever recorded. Since then the record figure has been twice excelled by a large margin. In May the production of domestic ferromanganese was 35,790 gross tons, surpassing any total ever made in this or any other country. The June output ranks second at 29,568 tons. These data are from the blast-furnace reports of THE IRON AGE, which include electrolytic alloy. The production of spiegeleisen has been large in the second quarter but it has not broken any record. The May output of 17,844 tons is the largest this year but is much less than the record outputs of 23,079 tons in May, 1917, and 22,947 tons in October, 1917. The following table gives the output of domestic manganese-iron alloys for the first half of 1918:

1918	Ferromanganese	Spiegeleisen
January	22,793	8,202
February	17,428	10,925
March	25,157	13,965
April	29,289	7,722
May	35,790	17,844
June	29,568	16,398
Av. per month, first half 1918.....	26,670	12,509
Av. per month in 1917.....	23,833	16,107

The average monthly output of ferromanganese in the first half of 1917 was 21,486 tons per month and in the last half of last year it was 23,080 tons per month, which indicates an increase in the first half of 1918 of over 3600 tons per month.

Available Supplies

The present situation as to available supplies is shown by the following table of output, imports and exports in gross tons thus far in 1918:

1918	Output	Imports	Exports	Available Supply
January	22,793	1,050	476	23,367
February	17,428	1,417	632	18,213
March	25,157	3,555	101	28,611
April	29,289	2,575	504	31,360
May	35,790	4,138	477	39,451
June	29,568	*5,739	†365	†34,942
Av. per month	26,670	3,079	426	29,324
Av. per month in 1917.....	23,833	3,703	†776	27,457

*Returns incomplete.

†Estimated.

‡Last half of 1917.

These figures show that the available supply in the second quarter advanced to an average of 35,251 tons per month as against an average of 22,679 tons per month in the first quarter, due to the phenomenal increase in output and a moderate increase in imports.

The importations have gradually advanced this year but are by no means equal to those of earlier years, even during the war. In 1915 these averaged 4605 tons per month and in 1916 they were 7577 tons per month. Thus far this year the average is 3079 tons per month, against 3703 tons per month in 1917.

Imports of Manganese Ore

The manganese ore situation has changed quite decidedly in the last half year. The following table presents the situation as to imports:

1918	Gross Tons
January	42,947
February	56,289
March	19,300
April	58,036
May	29,837
Monthly average to June.....	34,401
Monthly average in 1917.....	52,498
Monthly average in 1916.....	48,027
Monthly average in 1915.....	26,732
Monthly average in 1913.....	28,757

While at present larger than they were in 1915, they are decidedly less than in 1916 or 1917, being now only two-thirds of the 1917 rate. The restriction in imports, due to the shipping situation, explains this. Despite

this decline in imports, the output of ferromanganese has increased, showing larger supplies of domestic ores or at least large stocks of imported ores.

Ferromanganese Supply and Needs

Not long after the United States entered the war an official estimate placed the monthly needs of the steel industry at 28,000 tons of ferromanganese. This was based on the use of 80 per cent alloy. The foregoing analysis shows an average available supply of 35,251 tons per month for the second quarter and of 29,324 tons per month for the first half. Assuming the 1918 steel output to be close to 44,000,000 tons and that 74 per cent of this is open-hearth steel, as in 1916, with two-fifths of the Bessemer output absorbing spiegeleisen as high carbon steel, the following calculation gives the estimated amount of 70 per cent ferromanganese necessary this year at 19.5 lb. per ton of steel produced instead of 17 lb. per ton of 80 per cent alloy.

44,000,000 × 74	= 32,560,000	Gross open-hearth steel.
44,000,000 — 32,560,000	= 11,440,000	Bessemer steel.
11,440,000 × 2/5	= 4,576,000	high carbon Bessemer steel.
11,440,000 — 4,524,000	= 6,864,000	low carbon Bessemer steel.
32,560,000 + 6,864,000	= 39,424,000	steel requiring ferromanganese necessary in 1918
39,424,000 × 19.5 = 768,876,000 lb.	= 343,200	

Adding to the above 343,200 tons the 10,000 tons estimated as needed in the iron foundry business, we have 353,200 tons of 70 per cent alloy as necessary for our needs. To meet this total we have the probable available supply of 351,888 tons (29,324 × 12) as an available supply of 70 per cent alloy if the monthly average for the first half of this year is maintained for the rest of the year. Allowing for the usual indiscretions in an estimate of this kind and the use of spiegeleisen as a partial substitute, the deficiency is almost negligible.

Recent similar reviews of the manganese-alloy situation appeared in THE IRON AGE Dec. 6, 1917, Jan. 31, 1918, and April 11, 1918.

Heyward Steel Co. Organized

The Heyward Steel Co., Pittsburgh, has been organized under a West Virginia charter with a capital of \$250,000, half preferred and half common stock, and has bought the plant of the National Steel Casting Co. at New Cumberland, W. Va. This plant was built several years ago, but was unsuccessful, and has been idle for a year or more. It contains one 20-ton acid open hearth furnace, with complete crane and other equipment. The main building is 93x350 ft., and the plant is located on the Cleveland division of the Pennsylvania Lines West. The company has received from the Carnegie Steel Co. a large order for cast steel shell ingots, to be made into war essentials for the United States Government. The plant will be started in a short time on this order, and is expected to turn out about 40 tons per day. It is equipped to make castings up to 40 tons, but will not likely engage in the manufacture of castings during the period of the war. The officials of the Heyward Steel Co. are T. R. Heyward, Jr., president, E. M. Fahnestock of the Fahnestock Mfg. Co., Avonmore, Pa., vice-president, W. M. Orr, vice president and manager of sales, and Charles G. Pyle, secretary and treasurer. T. R. Heyward, Jr., president, is of the firm of T. R. Heyward & Co., dealers in iron, steel and alloys, Farmers' Bank Building, Pittsburgh.

The Union Switch & Signal Co., Swissvale, Pa., has recently installed two 6000-lb., two 3000-lb. and one 2000-lb. steam drop hammers, giving it a total equipment of 12 steam drop and shaping hammers, together with 18 board drop hammers. Plans for extension of die room and increased facilities for heat treating are being prepared.

A Portable Crane for Machine Shops

As a substitute for overhead traveling cranes, Fox Brothers & Co., 126 Lafayette Street, New York, have developed a portable outfit. Although designed primarily for use in the repair of locomotives and cars, the crane is nevertheless adaptable for handling heavy pieces of machinery in industrial plants.

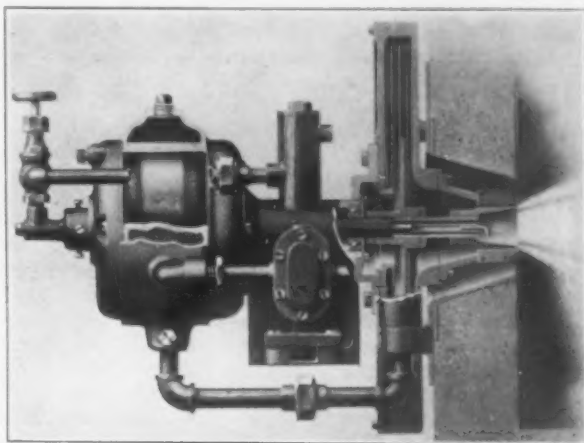
There are only six parts to the complete crane, four jacks and two cross-girders, all built of structural steel shapes riveted together with gusset plates. Each of the former is operated by a pair of handles arranged so that under ordinary circumstances either two or four men can operate one jack at a time, although in the case of light loads it is pointed out the handles are balanced, so that it is possible for one man to operate a jack. When power is applied to the handles, the shaft to which they are fastened revolves together with a mitre gear that is mounted thereon. This gear transmits power to the exposed vertical shaft through a bevel gear and a pinion at the upper end meshes with a spur gear which is keyed to the main screw that raises or lowers the nut or raising block as it turns. All of the gears are of a special grade of cast iron with cut teeth. In their lowest position, the cross girders are 32 in. from the ground and can be raised to an extreme height of 75 in., the total available movement thus being 43 in.

Each jack is mounted on cast-iron wheels with flat treads which revolve on shafts attached to an eccentric bearing. With this arrangement it is pointed out, when the jacks are in position, the pins are removed from the bearings which permit the wheels to rise and the entire base of the jack to rest upon the floor.

The working capacity of the crane is 60 tons, although each set is tested with a load of 75 tons. The maximum floor space required by each base is $5\frac{1}{2} \times 6$

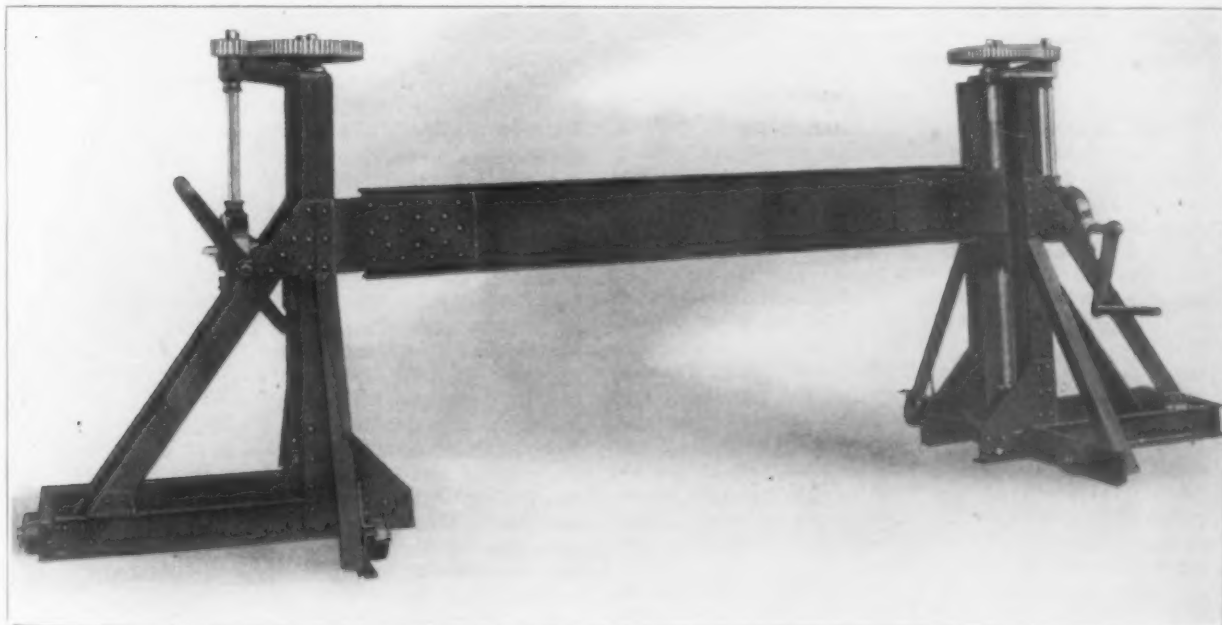
A New Type of Fuel Oil Burner

A burner for fuel oil which uses a method of atomizing the fuel in an open cup has been developed by W. S. Ray, San Francisco. The cup in which the oil



The Atomization of Fuel Oil in an Open Cup Which is Rotated at High Speed and Then Carrying the Fuel Into the Fire by Forcing Air at High Velocity around the Cup is the Distinguishing Feature of a New Burner

is atomized is mounted in a horizontal position and is revolved at the rate of 3450 r.p.m. by a Westinghouse totally inclosed motor. Air at high velocity is forced around the cup and in a direction away from it, thus to introduce the air required for proper combustion as well as directing the fuel into the firebox. Vanes have



A Portable Crane for Use in Industrial Establishments Has Been Developed as a Substitute for the Overhead Type Ordinarily Employed

ft., and the maximum height from the floor to the top of the main spur gear is 7 ft. The net weight of the crane is 8000 lb.

In order to assist manufacturers who are seeking to reduce labor turnover and reach maximum efficiency by the employment of industrial supervisors or employment managers, several courses designed to give women intensive training along the lines of industrial supervisors or employment managers are being offered this summer at Bryn Mawr College and in New York. Manufacturers can obtain full information in regard to obtaining such help by addressing the Bureau of Industrial Managers, National Board, Young Women's Christian Association, 600 Lexington Avenue, New York.

been inserted in the nozzle surrounding the atomizer to deflect the air into a straight path.

The hollow shaft of the driving motor has been extended to permit a worm gear to be fastened to the center of the shaft and the blower and atomizer are attached to the end opposite the motor. A Hess-Brigh ball bearing is used at each side of the worm gear.

The name of the Stewart Mfg. Co., Chicago, maker of die castings, has been changed to the Stewart Mfg Corporation. The business is now being conducted at 4535 Fullerton Avenue.

The Gibb Instrument Co., maker of pyrometers and scientific instruments, has moved from Cleveland to 1644 Woodward Avenue, Detroit.

LABOR RECRUITING PROGRAM

Task Declared More Difficult than Raising Fighting Forces

WASHINGTON, July 23.—Leaders of industrial management and labor in 28 States east of the Mississippi met in Washington on June 19 to learn the details of the Government's central war labor recruiting program and to be charged with the formation, together with the State directors of the United States Employment Service of the Department of Labor, of the State and local boards through which the program will be administered. They were told that the State advisory boards and community labor boards, projected by the Employment Service, must be organized by next Wednesday in order that all will be in readiness when the Government takes over unskilled labor recruiting on Aug. 1.

At the conference was one accredited representative each of the wage earning and the employing interests of each of these States. The employers' representatives had been nominated by the Chamber of Commerce of the United States and other manufacturers' associations and those of labor by the State federations.

The conference represented, according to Nathan A. Smyth, Acting Assistant Director General of the Employment Service and chief of its Unskilled Labor Section, "the taking of the nation into partnership with the Employment Service and its task from the word go." The spokesmen for employers and workers pledged the complete co-operation of their organizations. E. D. Howard, of the Industrial Bureau of the Chamber of Commerce of the United States, said that that body and its constituent organizations would work with the national and field officers of the Employment Service, while Charles P. Howard, of Portland, Ore., made a similar promise as spokesman for the American Federation of Labor.

Demand Exceeds Supply

"The war industries of the country are at present short of 500,000 unskilled workers and their coming needs will call for between 2,000,000 and 3,000,000 more," Mr. Smyth told the conferees. "Similarly, the demand for skilled workers for war production exceeds the immediately available supply and before long we will have to take every tool maker and die sinker in on war work and put him in war industry. Our industrial army's mobilization is a task far more difficult than that of the raising of the fighting forces and the community labor boards of the Employment Service, which will have general charge of the recruiting and distribution of labor among local industries, have a task that is of greater magnitude than that of the draft boards." If America is to "carry on in the industrial side of the war," he added, non-war enterprises must make sacrifices with respect to labor just as they are making them with respect to fuel, steel and other materials.

Felix Frankfurter, assistant to the Secretary of Labor and chairman of the War Labor Policies Board, said that with the working out of the Selective Service Act, the administration of the war labor supplying program will stand as the supreme monument of what voluntary co-operation can accomplish in a democracy. "The voluntary co-operation of a free people is the greatest force behind the war labor recruiting program," he said.

Appreciation by the country of the patriotism of its wage earners was urged by Charles P. Howard, speaking for the American Federation of Labor. The local community boards, he said, should do much to improve local conditions of transportation, housing and other conditions to increase the efficiency of workers.

Dudley Kennedy, employment manager American International Shipbuilding Corporation at Hog Island, said that the Employment Service had overcome his original skepticism through its ability to supply his company's 30,000-man plant with labor.

The War Labor Policies Board, at a meeting held June 19, voted to make the Secretary of Labor re-

sponsible for the enforcement of the contract clause with reference to the employment of children, which was agreed to by the board at its meeting last week. This action was taken in view of the desirability of centralizing the control of child labor.

All Government contracts are to contain a clause providing that the contractor shall not directly or indirectly employ, in the performance of the contract, any child under the age of 14 years, or permit any child between the ages of 14 and 16 years to work more than eight hours in any one day, more than six days in any one week, or before 6 a. m. or after 7 p. m.

"The action taken last week by the War Labor Policies Board," says Chairman Felix Frankfurter, "follows the well established precedent of the Government in making contracts subject to certain well established industrial standards. The adoption of these standards, in the opinion of the board, promotes the immediate, as well as the ultimate, welfare of the country. English and French experience has demonstrated that the employment of children under 14 or of those over 14 for long hours or on night work is not in the interest of sustained efficiency of production."

The action taken by the board to-day in delegating to the Secretary of Labor the enforcement of this child labor contract clause has the advantages of utilizing existing administrative machinery, with which employers and state officials are already familiar, and the avoidance of the confusion and duplication incident to enforcement by each department concerned.

Workers in War Industries

Following a meeting on July 20, machinists, tool-makers and apprentices at Newark, N. J., who declared a strike, July 17, with demand for 8-hr. day and increased wages, voted to return to work on July 22, the night workers reporting for duty on July 21. This agreement was reached following the announcement that a Federal arbitrator from the War Department would come to the city to consider the controversy between the employers and the men. In the neighborhood of 4000 men left their work, following the strike declaration, affecting many of the local plants, including the Westinghouse Electric & Mfg. Co., Splittorf Electrical Co. and Lionel Mfg. Co., Newark; Standard Tool Co., Arlington; International Arms & Fuse Co., Bloomfield; Crocker-Wheeler Co., Ampere; Crucible Steel Co., New Jersey Tube Co., General Electric Co., Otis Elevator Co., Hyatt Roller Bearing Co., and Henry R. Worthington Co., all of Harrison. The increased wages asked are: toolmakers, 85 cents an hour; machinists, 75 cents; machine specialists, 65 cents; and helpers, 50 cents, with time and one-half for ordinary overtime, and double time for holidays and Sundays. This scale is an increase of about 15 cents an hour for toolmakers, and 10 cents an hour in other cases. Employers, on the other hand, hold that the men are receiving wages equal to these in many of the local shops, and that the strike movement is one for organization purposes.

The John Wood Mfg. Co., Conshohocken, Pa., has voluntarily increased the wages of about 600 local employees 10 per cent, to help munition work at the plant.

Members of the local machinists' organization at Peoria, Ill., totaling about 1200, have received an advance of 20 cents an hour in wages, or an average of 80 cents.

Employees at the new works of the Westinghouse Electric & Mfg. Co., Essington, near Philadelphia, have organized a social club for entertainments, and will hold their first gathering on August 1.

Molders at the Brooks Works of the American Locomotive Co., Dunkirk, N. Y., were forced to stop work during the past week, due to a strike of about 150 helpers at the foundry.

The Philadelphia & Reading Railroad Co. has placed the car shop employees at its Reading, Pa., works on a 60-hr. week basis, an increase of five hours a week.

The open-hearth plants of the Carnegie Steel Co. at Sharon and Farrell, Pa., operated in full on July 4, all employees in these two plants volunteering to do so

as a part of their patriotic duty to help win the war. It is not recalled that ever before steel plants operated on the national holiday, and the men who volunteered to work on that day have been showered with words of praise. Recently at another open-hearth steel plant in the Shenango Valley, it was necessary to close down on July 4 to make some minor repairs, and thus a full 24 hours were lost. In order to make up this loss of time and steel, the men volunteered to work the following Sunday, and did so.

The Helmbacher Forge & Rolling Mills Co., Barton and Dekalb streets, St. Louis, a few days ago advertised for women laborers to sort scrap iron. More than a hundred women applied for the jobs on the following day. Fifty women were hired and are now at work in overalls and caps.

Representatives of the United States Labor Employment Service from Missouri, Tennessee, Kentucky and Arkansas met at St. Louis July 16 to devise methods of making labor more stationary, especially at plants engaged in war work. J. M. Breen, the representative at St. Louis, reported he had found by a survey that 16 2/3 per cent of all labor in St. Louis is employed in work on Government contracts. Mr. Breen suggested a card clearance system whereby each laborer would be given a card on which would be kept a record of his employment. In applying for work he would have to show that he left his last place of employment on Government work for good reasons.

Patriotic Meetings at Youngstown

Headquarters have been established in Youngstown, Ohio, for the United States Ship Emergency production department for the district composed of Ohio, Western Pennsylvania, West Virginia and Southern California. F. DuPont Thomson, formerly president of the Humphrey Pump Co., late chief engineer for the Lackawanna Steel Co., is in charge of the office opened on the fourth and fifth floors of the City Building in Youngstown. To inaugurate meetings for steel workers engaged on war orders, Frederick Searing, one of the dollar-a-year men giving his services to the Government, was in that city last week, and will probably remain during this month. A meeting was held Monday, July 8, at the new plate mill of the Brier Hill Steel Co., where the employees took the oath of service. The promise made with uplifted hand was that the plate mill workers will stick to their jobs, perform an honest day's work and do such other duties as may be requested by the president. An auxiliary flag of the United States Emergency Fleet production bureau was raised on this occasion. On Friday, July 12, a second meeting was held at the works of the W. B. Pollock Co., and the boiler makers and mechanics were addressed by Mr. Searing, Lieutenant S. J. Ainsworth of London, England, and others. A third meeting was held Saturday, July 13, at the Youngstown works of the Sharon Steel Hoop Co. It is planned to hold 50 meetings in all throughout the district, the purpose being to inspire patriotism and loyalty which when thoroughly aroused will increase production to the maximum. Youngstown, because of its geographical location, was chosen as the center of the largest plate production district in the world, including Pittsburgh and Cleveland and the Mahoning Valley within its territory, also Buffalo. The new tandem plate mill of the Youngstown Sheet & Tube Co. has now been in operation more than a month. The Youngstown Iron & Steel Co. now a subsidiary of the Sharon Steel Hoop Co., and the Republic Iron & Steel Co. operate plate mills. Early in September the Brier Hill Steel Co. expects to start its tandem plate mill. Electricity will be supplied from the Republic Heat & Light Co. plant at Lowellville, Ohio, and transmitted by wire a distance of about 15 miles.

The New Jersey Slag Products Co. has leased the properties of the Dickerson Succasunny Mining Co., at Ferro Monte, near Morristown, N. J., for a period of 15 years. The company has also arranged an agreement for the mining of slag on properties near Wharton.

Strike Stops Shipbuilding

SAN FRANCISCO, July 16.—Immediately following the launching of 17 vessels in San Francisco Bay on July 4, Charles M. Schwab gave the Moore Shipbuilding Co., orders for ten new steel ships with a dead weight carrying capacity of 9400 tons. This company now has contracts for building 50 ships, according to General Manager George A. Ames, and will expend at once approximately \$2,000,000 in enlarging its plant.

Among the vessels launched on July 4, was the 12,000-ton freighter Defiance, which was built at the Alameda works of the Bethlehem Shipbuilding Corporation in just 38 working days after the keel was laid. At once a keel of a similar vessel was laid and General Manager J. J. Tynan of the corporation promised Charles M. Schwab that he would complete this vessel in 28 days. But, on July 14 the boiler makers working in the Oakland shipyards struck and this vessel will not be completed within the designated time. The boiler makers to the number of 2200 claim that the Oakland Shipyards have not lived up to the Macy wage award, and as in that agreement the men agreed not to strike again during the progress of the war they decided in a meeting held July 14 merely to quit as individuals and took the action without the sanction of the Trades Council. Answering their claims that the Macy award was not lived up to, the builders assert that the wages agreed upon in that settlement have been paid, although they admit that the 10 per cent granted by the Government at a subsequent time has not been universal. The dispute as to whether the original agreement or the subsequent action shall stand as the Macy award is the cause of the walkout.

Trouble has also come to the Liberty Shipyards, the Government project in Alameda, which is to be operated by the Bethlehem Corporation. The Alaska Packers' Association having 13 acres with a frontage of 750 ft. adjacent to the proposed Liberty yards, declines to sell to the Government although it offers to lease. As a consequence all work on the proposed yard has ceased. San Diego and San Pedro are bidding to have the plant located in their section of the State, and if agreement cannot be reached with the Alaska Packers' Association either the yard will have to be cut down or the plant located in some other place.

Large Increase in Steel Corporation's Orders

Unfilled orders in the books of the United States Steel Corporation on June 30 were 8,919,866 tons, an increase of 582,243 tons over those reported for May 31. This is the first increase shown since January and is the largest of any month in the last 18 months. The next largest increase in that period was 484,612 tons for December, 1917. On June 30, 1917, the unfilled orders were 11,383,287 tons. The following table gives the unfilled tonnage at the close of each month since January, 1915:

	1918	1917	1916	1915
January	9,477,853	11,474,054	7,922,767	4,248,571
February	9,288,453	11,576,697	8,568,966	4,345,371
March	9,056,404	11,711,644	9,331,001	4,255,749
April	8,741,882	12,183,083	9,829,551	4,162,244
May	8,337,623	11,886,591	9,937,798	4,264,598
June		10,844,164	9,640,458	4,678,196
July		10,844,164	9,593,592	4,928,540
August		10,407,049	9,660,357	4,908,445
September		9,833,477	9,522,584	5,317,618
October		9,009,675	10,015,260	6,165,452
November		8,897,106	11,058,542	7,189,489
December		9,381,718	11,547,286	7,806,220

The St. Louis committee of the Missouri Fuel Administration and the Manufacturers' Association are carrying on a joint investigation as to the fuel needs of plants engaged in war work, so that a coal shortage such as was experienced last winter may be averted at least so far as war plants are concerned next winter.

The Cambria Steel Co. has inaugurated operations at its plate mill at the Johnstown, Pa., works, recently completed at a cost of over \$1,000,000, and will use the plant for the production of steel ship plates.

Retroactive Feature of New Revenue Bill

Both Internal Revenue Taxes and Tariff Rates May Be Made Effective from the Day the Bill Is Reported to the House

WASHINGTON, July 23.—At the conclusion of the first week's work of the Ways and Means Committee devoted to the consideration of the new revenue bill in executive session, it is apparent that the scope of the measure will be much broader than has heretofore been assumed, and that it will in fact take the form of a very complete codification of all the internal revenue tax laws now on the statute books, and in addition may provide for a more or less comprehensive revision of the Underwood-Simmonds tariff act. Sentiment in favor of tariff revision, at least to the extent of placing a flat duty of 10 per cent or more on the items included in the free list of the present law, together with compensatory duties on the corresponding finished products, is making some headway, owing to vigorous propaganda being urged by protectionists in both Houses and the fact that the United States Tariff Commission is understood to have made so much progress in the collection of information regarding the industries of the United States and the principal manufacturing countries of the world that it will no longer be disposed to recommend against tariff revision as it did in the case of the war revenue bill which became the Act of Oct. 3, 1917.

New Tax to Date Back

The first executive session of the Ways and Means Committee following the close of the hearings on the revenue bill was signalized by an incident of the highest importance to all taxpayers, and especially to manufacturers and consumers in the event that Congress should decide to revise the tariff at this time. Chairman Taussig of the United States Tariff Commission laid before the committee an urgent recommendation for the incorporation in the bill of a provision making all new internal revenue taxes or tariff rates effective from the date on which the bill is reported to the House, rather than upon the date of its passage or upon some subsequent date, as is the usual practice in such matters. The proposal is for what is technically known as interim legislation.

If Dr. Taussig's proposition is adopted, and there is now every indication that it will be, every item of taxation suggested by the House bill would be of vital importance, for trade and industry throughout the country would be put upon its notice that the taxes and rates proposed by the Ways and Means Committee would become effective from the date the bill was reported to the House, provided, of course, the Senate gave them its approval. This plan is beset with many complications and makes it highly important for all prospective tax payers or importers to take prompt cognizance of the House measure, and protect themselves accordingly, instead of postponing the adoption of policies until the final passage of the bill.

The avowed purpose of Dr. Taussig's plan is to prevent action by taxpayers to evade the burdens of the new law by anticipatory transactions, including sales, transfers, importations, etc. If, for example, the new revenue bill as reported by the Ways and Means Committee should provide for a tax of \$100 on the sale of an automobile having a certain horsepower, all transactions on and after the date of the presentation of the bill to the House would be subject to such new rate of tax as the law might ultimately provide, and every automobile manufacturer would be required to keep a careful record showing his sales during the interval after the reporting of the bill and before its passage, and would be liable thereon for the tax at the rate finally adopted in the statute. It is easy to see that this plan is replete with interesting possibilities. If the bill should be pending in Congress for two or three

months, as is likely, a decidedly vexatious situation would develop through the charging of additional amounts sufficient to cover the new tax.

Gasoline Would Advance

Automobile manufacturers and representatives of gas engine builders here are much interested in the application of this principle to the proposed tax on gasoline which has been strongly recommended to the committee at rates ranging from 2c. to 10c. per gallon, the tax to be paid by the wholesaler. Such a tax would force the price of gasoline up to from 35c. to 45c. in different parts of the country and would have a very important effect upon its consumption. Should the House report a tax of 10c. per gallon, this rate would become immediately effective, and dealers in gasoline would be obliged to add the amount to all sales in order to protect themselves in the event that such a tax should remain in the bill when finally enacted. The question here arises as to whether, should the Senate reduce the tax, the wholesaler would be required to refund the excess collected or be permitted to put it in his pocket. It appears likely that a provision will be incorporated in the bill, if the Taussig plan is adopted, requiring excessive collections on account of the tax to be refunded.

Dingley Bill Losses by Anticipatory Imports

A careful scrutiny of the importations made during the five months from March to July, 1897, which included the period from the date of the reporting of the Dingley bill to the House until the law became effective, discloses the fact, according to the Tariff Commission's memorandum, that the Government lost approximately \$75,000,000 because of anticipatory importations, at the former low rates, which were made before the new rates went into force. Upwards of \$1,000,000 of this amount was covered by importations under the metal schedule which were hastily made with a view to avoiding the large increase provided by the Dingley Act. Thus, on tin plate the Government lost \$279,251; on cutlery, \$164,468; on firearms, \$54,575; on machinery \$51,009, and on miscellaneous manufactures of iron and steel \$55,332. Large anticipatory imports of lead were made, on which the importers saved \$152,404, while on spelter approximately \$4,000 was saved. The loss to the Government by reason of anticipatory importations of other metals, metal compositions and manufactures brought in under the Wilson rates to avoid payment of the Dingley rates, is estimated at \$184,595.

The Question of Impairing Contracts

The Tariff Commission has gone so far as to suggest the text of a provision which is desired either to be incorporated in the new law so as to authorize the interim application of new rates, or which might be adopted by Congress as a joint resolution, that would concern, in its adoption, all taxpayers, producers and consumers. Some interesting legal questions arise in connection with this tentative provision, especially with respect to the impairment of contracts. This difficulty the commission has foreseen, however, and it has further suggested that a proviso be incorporated in the proposed legislation to the effect that "any person who, prior to the date of the report of such bill to the House, shall, in good faith, have made contract to deliver any articles, and who, by reason of new or increased customs duties or increased internal-revenue taxes shall under such contract suffer loss consisting of such increase, on furnishing satisfactory proof to the Secretary of the Treasury of loss accruing by reason of such

increase shall be entitled to a refund to an amount not exceeding sufficient to compensate for such loss; provided that such satisfactory proof be furnished to the Secretary of the Treasury within 90 days after the date when such loss accrued."

It is the best opinion here that the House bill will not be ready to be reported by the Ways and Means Committee before Aug. 20, and Chairman Kitchin has ventured the opinion that in view of the sweeping character of the legislation which is to take the place of practically all taxing laws now in existence, the committee may not be able to finish its task before Sept. 1. In any event, it seems improbable that the new statute will be finally enacted before Nov. 1. Hence it is reasonable to assume there will be an interim period of not less than 60 days.

National Federation of Building Industries Organized

As a result of a conference of building interests throughout the country at Atlantic City, July 15-16, held at the call of Harry A. Wheeler, Chicago, president of the Chamber of Commerce of the United States, an organization to be known as the National Federation of Building Industries has been effected, designed to represent every branch of the industry from raw and finished materials to the erection and completion of a building.

The meeting had been arranged to include delegates and representatives from engineering and building associations of all classes interested in the industry, as well as representatives of large contractors, engaged for the most part in the erection of large industrial works. Fifty-five national organizations, 55 regional associations and 53 individual concerns were represented at the conference.

At the final session, Tuesday afternoon, an executive board was elected headed by B. F. Affleck, Chicago, president, the Universal Portland Cement Co., and president, the Portland Cement Association.

Allen Walker, New York representative, the Chamber of Commerce of the United States, and E. A. Roberts, secretary of the Builders' Exchange, Cleveland, were appointed chairman and secretary, respectively, at the Atlantic City meeting. S. Osgood Andrews, Pittsburgh, Plate Glass Association, was elected treasurer.

The war service committee for the federation will be perfected immediately, to hold its first meeting on Monday, Nov. 4. In this, the bylaws of the federation provide for the appointment of at least two delegates to this committee from the War Service Committee of the individual industry, provided that such a committee is now in existence.

Apart from the regular business of the convention, the building contractors present held a private meeting to perfect plans for the organization of a national association of contractors, there being no nation-wide organization of this character at the present time.

Notable Foundry Development at Saginaw, Mich.

The cost of the first unit of the new plant which the General Motors Corporation will erect in Saginaw, Mich., for the production of automobile castings, will be about \$1,100,000. Additional units will be added later. Frank D. Chase, Inc., industrial engineer, People's Gas Building, Chicago, is the engineer in charge of the work. The first unit of the plant will comprise a foundry building, 163 x 440 ft.; a core building, 100 x 400 ft.; a cleaning room, 110 x 265 ft.; pattern shop and storage, 100 x 120 ft., also sand storage buildings and a power house.

The Saginaw Malleable Iron Co., Saginaw, Mich., will double the size of its foundry by the immediate erection of an additional foundry building, 140 x 400 ft., and an addition to its power house, the cost of these additions being approximately \$125,000. The building of the additions will be in charge of Frank D. Chase, Inc., the designer of the original plant.

Becker Steel Co. of America Taken Over by Government

The Becker Steel Co. of America, with offices at 90 West Street, New York, and a plant at Charleston, W. Va., has been taken over by A. Mitchell Palmer, Alien Property Custodian, on the ground of its German ownership. The company owns the patent rights in this country for a method of producing high-speed steel, which is largely used in the construction of airplane and automobile motors, tools, dental and surgical instruments, etc. As a result of the action of the Alien Property Custodian it is stated that the so-called secret process of the company for the making of high-speed steel will be Americanized. The Becker Steel Co. is now doing considerable work in connection with Government contracts, and this will soon be very materially expanded.

The Government investigation that has been under way showed that of 5297 shares of stock issued in the name of Wilhelm Peters, president of the company, 5000 shares were held in trust for enemy interests, namely, for Reinhold Becker and the Aktien Gesellschaft of Willich, Germany. It developed in the investigation that Adolph J. Becker, vice-president of the company, in the fall of 1916 purchased tungsten and ferrovanadium with \$140,000 which he claimed his brother, Reinhold Becker, gave him. He stated that he purchased 33,075 lb. of tungsten with \$90,956 of this money and shipped the metal to Germany by the German submarine Deutschland. He also purchased 22,050 lb. of ferrovanadium for \$25,664, but was unable to ship this to Germany, and later sold it at a profit of \$6,000.

Adolph J. Becker was naturalized in 1907, after eight years' residence in the United States. In 1911 he opened a New York branch of the German house by organizing the Becker Steel Co. of America, a New York corporation, with a capital stock of \$10,000, later increased to \$250,000. In 1914 the New York corporation purchased the Baldwin Steel Co. of Charleston, W. Va., and a deed of trust was executed in favor of the Title Guarantee & Trust Co. of New York of the entire plant and property securing a \$500,000 bond issue. The New York corporation was dissolved, being succeeded by the Becker Steel Co. of America, a corporation organized in the State of West Virginia, and at present authorized to do business in the State of New York. The authorized capital stock was \$750,000. The company purchased from Reinhold Becker of Crefeld, Germany, the patents and processes for the making of steel and tools by the payment of \$250,000 in capital stock of the New York corporation and \$250,000 of the bonds of the corporation.

The Alien Property Custodian announces that he has appointed the following directors to act for his office in the management of the Becker Steel Co. of America: William H. English, vice-president Empire Trust Co., 120 Broadway, New York; E. M. Sawtelle, 5 Beekman Street, New York; Paul T. Brady, Westinghouse Electric & Mfg. Co., 165 Broadway, New York; George I. J. Midvale Steel & Ordnance Co., Philadelphia; W. A. McCorkle, president Citizens' National Bank, Charleston, W. Va. Royal A. Weller, 31 Nassau Street, New York, and ex-United States Senator William E. Chilton of Charleston, W. Va., will act as counsel for the company.

Will Erect Nitrate Plant at Toledo, Ohio

The Air Nitrates Corporation, which will build a Government nitrate plant at Toledo, Ohio, has acquired a 500-acre site on the eastern side of the Maumee River that has for some time been the property of the Cleveland-Cliffs Iron Co. On this the company will erect a \$20,000,000 plant which it plans to have completed in eight months. It will be of steel, brick and concrete construction. The company has established executive offices in the Nasby Building, Toledo. Walter Stewart has been selected as the Toledo resident representative and W. C. McKeon as resident purchasing agent.

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Production and Prospects

The present rates of production of pig iron and of steel ingots are satisfactory or unsatisfactory according to the viewpoint. From the viewpoint of last January and February, when the industry was struggling with unheard of difficulties, the present performance is quite satisfactory, for there were few at that time who ventured to hope that anything like full production rates would be restored. It was not assumed, of course, that all the barriers to full production then existing would continue, but it was felt that if some barriers were removed others would be discovered, and one barrier in particular, a labor shortage.

On the other hand, present rates of production are quite unsatisfactory by comparison with capacity. The country produced 39,434,797 tons of pig iron in 1916 and with new furnaces since completed it should easily be able to produce 43,000,000 tons a year at present. Our blast furnace report for June, however, indicated a rate of only 40,830,000 tons. In 1916 there was an average of 318 coke and anthracite furnaces in blast. Last month there was an average of 357. This is a larger increase in number than would be necessary to make the indicated increase, for in proportion 357 furnaces should make 44,000,000 tons a year. Probably some furnaces of smaller capacity are in operation. The important feature of the showing is that it indicates that not many furnaces, if any, are out of blast for lack of coke or for repairs. The existing furnaces are not producing as much iron per furnace as they should. It will be recalled that the performance in 1916 was a surprise. The increase over outputs in immediately preceding years was much greater than could be accounted for by additional furnaces in blast, new or old. Comment was made upon this fact at the time. The furnaces are not doing as well per furnace as in 1916, but are doing as well as in previous years or better.

As to steel ingot production, the revised figures for June presented in this issue indicate an annual rate of steel ingot production of 43,500,000 tons. In 1916 the production was 41,400,000 tons, and new capacity completed should make it possible to produce, with conditions such as obtained in 1916, fully 47,000,000 tons. There is practically no steel making capacity idle, except approximately a nor-

mal proportion of individual open-hearth furnaces out of operation for repairs.

The relation between pig iron production and steel ingot production is substantially the same as obtained in 1916. It is easily observed, however, that the consumption of pig iron outside the steel works, chiefly in iron foundries, is materially less than in 1916, hence the consumption of pig iron per ton of ingots produced is increased. Correspondingly less scrap is being used. The difference, however, is much less than the 4,000,000 ton gap between ingot production and ingot capacity. Nearly all the steel works testify to the poor quality of the scrap they are forced to use, for lack of something better. The furnace charge is reduced and the time of the heat is lengthened. If heavy melting steel were substituted, ton for ton, for the light and otherwise poor material used, the furnaces would be charged more heavily and would make their heats more rapidly, with the result that a large shortage in scrap tonnage would be uncovered.

While the steel works complain of some labor shortage and also of some slackness in labor performance, it is evident that this condition is not curtailing the production of steel, otherwise pig iron or scrap would accumulate, and it is certain that no accumulation is occurring. It is clear, furthermore, that there will be no material increase in the supply of scrap.

Any further and considerable increase in the steel output, therefore, must come through a larger supply of pig iron, and there is room for expansion in that direction, considering the capacity and the present rate of production. Better labor performance at blast furnaces is requisite, also a larger supply of coke and an improvement in the quality. Both are promised. Through the efforts of the Fleet Corporation and the Fuel Administration the labor in the Connellsville and other coke regions is being stimulated to better performance, which means more regular drawing, increasing the tonnage and improving the quality, while by-product coking capacity is increasing.

A gratifying feature of the steel ingot reports is that since the low rate of production shown for last January each month has recorded a successive increase in the rate of production, when comparisons are made based on the number of steel work-

ing days in the month. The rate attained in June was 5.1 per cent above the rate in 1916 and 3.1 per cent above the rate in 1917. On the whole, production is more nearly at capacity rate than might be expected considering the difficulties of the situation.

A Split on British Policy

The full text of the report of the committee appointed by the British Board of Trade to consider the position of the iron and steel trades after the war has now been received in this country and shows somewhat more clearly than did the abstract printed in THE IRON AGE of July 11, the radical differences of opinion of the members of the committee. The recommendations are divided into 12 chapters: Commercial Reconstruction, Iron Ore, Export Sales Association, Organization, Labor, Protection, Royalties, Means of Transportation, Technical Education, Commercial Intelligence, General Subsidiary Questions and General Summary, and on only one of the chapters, that on Export Sales Association, are the members unanimous. Sir Hugh Bell was the principal objector, but other members found themselves unable to agree to numerous recommendations submitted.

On the question of government aid, Sir Hugh Bell stood alone in vigorous dissent from the opinions of his associates. In the chapter on Iron Ore, in which all of his associates declare that "it is no longer safe to entrust the very life of the iron and steel industry entirely to the efforts of private enterprise" and recommend co-operative effort, backed where it is found necessary by Government support, Sir Hugh records his opinion that any intervention by the state in enterprises of this sort is most undesirable and should take place only when there is overwhelming evidence of its necessity. "The employment of funds raised by taxation," he says, "is eminently dangerous and should not be resorted to except under pressure of the gravest kind." The fact that Sir Hugh is the only one who expresses this opinion shows how strong is the tendency to lean upon the Government.

In regard to protection, five members of the committee declare that they are convinced that for the safeguarding of the iron and steel industries, it will be necessary to establish a system of protective duties and they say that in this opinion they are supported by the practically united feeling of the British iron and steel producers who have given evidence before the committee. If this is true, it would be well for the United States to take it for granted that Great Britain will adopt a protective tariff. Two members of the committee agree as to the recommendation, but submit a note stating that they consider it imperative that a safeguard should be provided by the Government against the raising of prices unduly against the consumers and to the disadvantage of labor. Messrs. Bell and Davison differ radically with the other members. Their arguments are, for the most part, those which have always been advanced in favor of free trade.

On the whole, in reading the report, one gets the impression that the investigation has been

worth while if for no other purpose than in laying the foundation for future investigation, but on the issue of protection and free trade, Messrs. Bell and Davison say that it would be the height of impropriety to seek to reverse the considered policy of more than two generations except after the most careful consideration and investigation by a competent authority constituted for the purpose. They add: "It is impossible to conduct such an investigation while we are still in the state of excitement and anger which the bloodiest and most destructive war ever fought has inevitably produced. It should certainly not be begun as the result of an inquiry of the character conducted by this committee, from whose deliberations all broad aspects of the case have been almost necessarily excluded."

All investigations made during a time of war are conducted under difficulties, and recommendations made by any committee or commission as the results of investigation during a war period, would be subject to criticism and revision; but the countries which neglect to carry on any preliminary work in the way of getting at the facts may find at the conclusion of peace that the delay has been very expensive and that other nations which have been alert and acted with more promptness gained a distinct advantage. Delay for the purpose of investigation after the conclusion of peace might prove to be ruinous. Hence, we trust that any investigations that have been started in this country by the United States Tariff Commission or any other official or business organizations will be continued.

A Story of Two Shops

That the bonus system of rewarding employees for extraordinary output may work disadvantageously at times and that experience and skill, though coupled with years, should not be ignored are among the suggestions of a story of two munitions companies. It is related that in the shops of one of the concerns a bonus system prevails and that under it the greater strength, endurance and facility of movement possessed by the younger men is reflected in their ability to produce more shells and thereby add more to their wage than can the older machinists. Some of the latter, seeing their juniors—usually men of less skill as well as experience—outdo them in the matter of money received became dissatisfied and sought employment in another plant. When they made application they were heartily received and they entered an establishment where the pay is good but where no bonuses exist.

The plant with the bonus system has a high rate of rejections, the loss of which falls on the company. The men have received their bonuses for the faulty as well as for the good shells. In contrast, in the plant where there is no bonus system there is not the same rush to turn out work and the rejections are very few, so few in fact as to be a matter of wonder. Frantic production has been lacking, and perhaps there has been less of the driving spirit, but the energy used has been properly and efficiently applied, all making

for thoroughness and naturally a larger percentage of product acceptable to the inspector. In time past, it is no secret and the same is true today in some places—that machine tools have been battered to pieces by mistaken haste, crudely applied force and lack of judgment.

It will not do to generalize too broadly from the two cases cited, but the facts are presented for whatever instruction they may convey to those charged with the responsibilities of shop management.

Manganese Conservation

Because of the large increase in available supplies of ferromanganese, less is heard about methods of conservation in its use. An analysis of the situation on another page emphasizes the remarkable expansion in domestic output in the last three months. Production in the second quarter was 50 per cent larger than in the first quarter and was at the rate of over 378,500 tons per year. The 1917 output was about 286,000 tons. This increase is only in small part due to the larger production of 70 per cent alloy instead of 80 per cent.

In the whole discussion of manganese conservation not enough has been said of the saving possible from premelting in electric furnaces. An article elsewhere gives the recent experience of one large American company in this practice, and in one printed in the issue of April 11, 1918, a Swedish metallurgist discussed foreign practice in this regard. The testimony of the American company puts the possible saving in manganese at 5 to 33 per cent, with a saving in cost per ton of ingots produced of from 20 to 75 cents. This applies to electric steel. The Swedish authority maintains that Swedish and German experience shows an average saving of 44 per cent in manganese. The advocates of this method figure that an average saving of from 20 to 33 per cent is possible from its general application in American steel making.

Assuming the average saved to be 25 per cent, and taking our needs of ferromanganese for 1918 at 352,000 tons, as in the statistics elsewhere, would mean a saving of about 88,000 tons of alloy worth \$2,200,000 at the present market price. It would also mean the production of about that much more pig iron now greatly needed, to say nothing about the release of freight room for other purposes.

The American experience referred to states that the cost to premelt electrically is \$25 per ton, but that it will probably later be reduced to at most \$20 per ton. According to some estimates, it would have been possible before the war to accomplish this for \$12 per ton, if foreign practice were adapted to American conditions. Under present circumstances a cost of \$25 per ton for premelting is set over against a possible 25 per cent saving in alloy which at \$250 per ton means over \$60.

In any event, the important facts should not be lost sight of that the use of premelted ferromanganese insures a better and more uniform steel, a saving in time in making a heat, and a lower temperature steel for final pouring. If quality steel in quantity is to be the watchword in the future and if open hearth steel must sooner or later compete with the large triplex electric plants, then, as a

means of attaining this ideal, the premelting of ferromanganese is a factor. Germany has always been foremost in this practice. The American steel maker has been slow in taking it up, partly because there has always been enough manganese and partly because some previous attempts have failed through the use of the wrong type of premelting medium.

Advanced Foundry Construction

The art of the molder appeals strongly to the eye. Iron flowing from the cupola makes an attractive picture. For all that goes on in the foundry a better setting is being provided, not because of any artistic motives, but because it is better business to do so. Foundry employees ask why they should work in a dark and grimy place. Employers find that production is enhanced and quality improved when working conditions are clean, sanitary and attractive to a degree that inspires self-respect. Under such incentives for improvement it was to be expected that a change would come. No one with a mental picture of the old-time foundries, with their smoke and dust-begrimed windows, their lack of ventilation, their crowded floor space filled with impediments to production, could think otherwise. But few could have guessed how great the change would be. That foundries can be made really beautiful, as well as efficient, has been proved.

These observations are prompted by the number of admirably designed and equipped foundries for the manufacture of all kinds of castings that have been built since the war started, and the others now in course of erection or in contemplation. It would seem as if founders became aroused all at once, also that they had reversed the injunction, "In time of peace prepare for war," considering it equally advantageous in war time to prepare for peace. Certainly the foundry industry, or a large part of it, will be in excellent position to meet a heavy industrial demand when it comes.

The builders of the newer foundries, largely through the assistance of engineers who specialize in plant construction, are approaching their problems in a scientific way. As recently pointed out by Frank D. Chase, of Chicago, they consider, in relation to plant location, the following: raw materials, transportation, fuel, water and power, labor and market. As to plant site, they have in view railroad and teaming facilities, labor supply, transportation of labor, housing of labor, area for present and future needs, adequate water, sewerage, light and power facilities and accessible market, while in regard to plant construction they figure on layout of buildings, types of buildings and proper handling of design and construction.

Enough has been written of these model plants to make it necessary only to refer to their layout to effect a straight-line process of manufacture, their mechanical means of handling material, both raw and finished, their abundance of windows, and the great number of features that make for the health and well-being of the men who work in them. Under the modern system of building, all these are co-ordinated by organizations which

work in harmony while covering all details. Finding serious defects in design and construction when a new plant begins operations should be a thing of the past.

British Steel Trade Raises Questions in Parliament

The situation regarding wire and wire products in the United Kingdom was recently the subject of questions in the British Parliament. Captain Barnett asked the president of the Board of Trade whether he was aware that the manufacture of wire and wire products in Great Britain is being seriously jeopardized by the dearth of raw material; whether wire manufacturers who have been asked to rely upon English mills for their supply of wire rods are only receiving about 8 per cent of their requirements, and if so what steps he proposes to take in order to remedy this state of things; also whether he was aware that the shortage of wire rods is making the manufacture of barbed wire increasingly difficult, and if so whether he will endeavor to secure the importation of larger supplies of the raw material instead of ordering from abroad the manufactured product?

The reply was that in regard to barbed wire manufacture, the whole of the existing plant is employed to its fullest capacity. From June 1 all the wire drawers had been allocated a supply of English rolled rods equal in quantity to the average of their output per month during the previous five months of 1918. A new rod rolling mill had just started and another large one was expected to start in October next.

Another question put concerned the supply of tin plates and steel to France. The Secretary of State for Foreign Affairs was asked whether, in connection with the supply to France of tin plates and steel, the system of having only one buyer, the Comité des Forges, for all British exports to France was initiated and maintained at the request of the British Government; if so, whether the policy will be reconsidered, in view of the dissatisfaction expressed among manufacturers and merchants both in Great Britain and France regarding the monopoly at present enjoyed by the Comité des Forges. He was asked also whether he is aware that the activities of the Comité des Forges de France are giving concern to manufacturers in England; that this body, which is a private association of the principal French steel works, holds the monopoly of imports into France; that British merchants were, and are now, able to supply tin plates and steel at much lower prices than the Comité des Forges is now charging the French consumer; and whether he is prepared to receive and consider the views of British merchants on this matter?

In reply, the Minister of Blockade said he had nothing to add to previous answers. These, according to statements recently current in the British steel trade, neither vouchsafed information nor offered help to the British manufacturer or merchant, and the dissatisfaction of the latter with the doings of the Government and certain of its members is reported to be growing.

A New Gary Tin Plate Mill

The American Sheet & Tin Plate Co., Frick Building, Pittsburgh, has decided to erect a new tin plate plant at Gary, Ind., to contain 12 double or 24 single hot mills. It will be practically a duplicate of the existing tin mill plant at Gary, built in 1916, which also has 24 hot mills. No contracts have yet been placed for equipment, but the company hopes to have the new mill completed within a year. It will have an annual capacity of about 2,250,000 base boxes of tin plate.

The plant of the United States Electric Steel Co., Connellsville, Pa., has been leased from the trustees in bankruptcy by the Jessop Steel Co., New York, which has assumed control of the plant.

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Additional Midvale Gun Plant

It is probable that an arrangement will be made by the Government with the Midvale Steel & Ordnance Co. for the building of an additional shop at Nicetown, Philadelphia, for the manufacture of 12-in. howitzers. The contract recently entered into by the Government and the Midvale company, and under which construction work is now in progress, calls for additional steel capacity and a gun shop, heat-treating plant, etc., for the manufacture of 16-in. howitzers. The proposed new shop will be alongside of the one now being built. Whether additional steel capacity will be required has not yet been decided. It is expected that howitzers will be turned out at the Nicetown additions in the latter part of 1919. The trucks on which they are mounted will be built by other manufacturers.

The standardization of milling cutters and small tools, including relieved cutters, non-relieved cutters, end mills and reamers, will be attempted by the British Engineering Standards Association, at the request of a large number of manufacturers who report production hampered through lack of it.

New Phase in the Steel Supply Problem

20,000,000-Ton Estimate for Next Six Months Challenged—Sharp Protest from Automobile Manufacturers—Mr. Replogle's Position

WASHINGTON, July 23.—The steel supply situation is again becoming acute as a result of a number of developments of the past few days. The astonishing speeding-up of the steel shipbuilding program under Mr. Schwab's direction is the chief factor in the problem, as it promises an output for the new fiscal year just begun closely approximating 8,000,000 deadweight tons of ships, provided the Director General's plans for securing auxiliaries in the way of engines, boilers and ship fittings can be realized. Pressure from the leaders in the less essential industries and the demands for steel of the automobile men, which have been exceedingly vigorous during the past week, have served still further to strain the situation, while other contributing factors have been the efforts of the conservation division to cut down the steel consumption of numerous lines of manufacture by standardization and the elimination of unnecessary types and sizes, and the rather unsatisfactory returns made by a number of Government bureaus called upon by the War Industries Board to revise their figures of steel requirements for the coming year.

Automobile Makers Sharply Protest

The most pessimistic view of the outlook with respect to steel supply that has been presented by any well informed Government official was very positively advanced by Chairman Baruch of the War Industries Board at a conference last Wednesday, when Hugh Chalmers and several other automobile manufacturers who came to Washington in a decidedly aggressive mood demanded, among other things, that they be allowed for the coming year 60 per cent of the steel used last year, that enough of certain kinds of steel be furnished them to permit them to round out their manufacturing inventories for four or five months following August 1, and that a definite percentage basis of steel supply be provided in place of what they described as the rather vague promises to make the best possible provision for the non-war industries after the Government's requirements have been taken care of. The automobile men intimated to the War Industries Board that the Government's promises to provide war work for factories curtailing their output of passenger cars during the past year had not been kept, and that a number of plants which had kept down the production of pleasure cars had suffered heavily thereby.

Chairman Baruch, who in a conference of this nature meets the brunt of the attack in person, made a short but emphatic statement of the steel situation as viewed by the Government experts. The war needs of the nation for the remaining six months of 1918, he said, called for 20,000,000 tons of finished steel, while the best information obtainable indicated that the output of the industry would not exceed 16,500,000 tons. Under these conditions he said the Government could not promise any industry any fixed percentage of last year's consumption, nor could it make any pledge not contingent upon the further expansion of war requirements. The War Industries Board, he said, was strongly disposed to assist the automobile manufacturers and all other manufacturers using steel, and the subject of rounding out inventories would receive careful consideration in the future, as it has received in the past.

The automobile men promptly challenged Mr. Baruch's statement that the war needs of the Government for the coming six months will approximate twenty million tons, declaring that whatever the officials in charge of the war program might desire in the way of material, it was beyond the capacity of existing plants to consume any such quantity of steel. Mr. Chalmers intimated that the men in charge of the various manufacturing and construction projects were protecting themselves by asking for the total amount of steel they would like to use, quite irrespective of the fact that it would probably not be possible to use it all within the estimated period. A careful readjustment of allocations, and a judicious pruning of overliberal estimates, it was contended, would show a surplus of steel even on the basis of output suggested by the War Industries Board. The attention of the automobile men being drawn to the fact that Fuel Administrator Garfield has already curtailed their coal supply for the coming year to twenty-five per cent. of the amount consumed last year, the reply was made that this curtailment, though drastic on its face, would not prevent the production of sixty per cent. of last year's output of pleasure cars if sufficient steel could be provided for the purpose. Automobile plants, it was said, are now receiving orders for trucks and various kinds of war material for which they will be provided with fuel in addition to the allotment for the manufacture of pleasure cars, and this fact, in connection with arrangements already made for the purchase of power from public utility plants will enable the manufacturers to make more cars than they can possibly hope to secure steel for.

Automobile Steel Supply to Be Inventoried

The automobile men having disclosed the fact that some of their plants have nearly all of the steel necessary to run four or five months on passenger car production, and only need small quantities of special steel to enable them to turn a large amount of material into money, members of the War Industries Board reminded them that in the agreement made last fall the pleasure car builders were to make no steel commitments for the fiscal year beginning July 1, 1918. The automobile men promptly protested that they had not been guilty of bad faith, and that such steel as had been accumulated had been acquired in strict conformity with pledges heretofore given. Mr. Replogle thereupon gave formal notice to the automobile men to place in the hands of the War Industries Board, within the next ten days, complete inventories of all steel on hand. It is understood that these inventories will include quantity, kind, date of purchase and parties from whom obtained, and possibly price paid. These statements will afford the Government officials a basis for determining not only the exact amount of steel necessary to round out inventories, but the quantities of each kind held by every pleasure car producer in the country. It is also intimated that if the showing of these inventories justifies it, the Government may commandeer a considerable percentage of this steel and transfer it to plants making war material.

The automobile men left the conference with the War Industries Board in a very unpleasant mood.

While Mr. Chalmers denied that he had told the board that the proposed curtailment of the automobile industry would be resented by the people at the polls next November, he is very definitely reported to have said that the board's policy would be rendered more immediately effective if it provided for the appointment of a receiver for the State of Michigan. Members of the board declined to make any comment upon Mr. Chalmers's remarks, stating that there would probably be no further action with respect to the automobile situation until the steel inventories called for had been received and digested.

Steel Issue Brought to the President

While no formal appeal from the board to the White House has been taken by the pleasure car makers, they have succeeded in reaching the President's ear, and have given him their version of the situation which they claim exists not only as to automobiles, but other so-called non-essential industries. Whatever representations have thus been made will be very fully met by facts and figures heretofore communicated to the President by Mr. Baruch, who has conferred with the Chief Executive at short intervals regarding the steel supply ever since the situation became acute last spring. Both Mr. Baruch and Mr. Replogle have the President's confidence, and there is little prospect that he will interfere beyond urging the board to do everything possible to obtain a maximum of surplus steel above war needs of the Government, and to increase production by every device that can be resorted to.

Mr. Baruch and Mr. Replogle are giving very earnest attention to what they regard as two most important factors in the steel supply problem, namely, the pruning of Government estimates and the expansion of steel production. These efforts are not being made as a result of the attack made on the War Industries Board by the automobile men; as readers of THE IRON AGE know, they were undertaken several weeks ago. As a matter of fact, the interest in the steel situation manifested by the daily press during the past week is believed by many close observers here to be due largely to the command of publicity of the pleasure car makers. Of course it should not be understood that the War Industries Board is not giving serious attention to the representations of the automobile men, whose plight is fully appreciated.

Steel for Motor Trucks

While the drastic restriction of the output of pleasure cars is regarded by the War Industries Board as necessary for the conservation of the steel supply, manufacturers of motor trucks are to be more liberally dealt with under an agreement that has just been reached between the Priorities Board and a special committee headed by George Graham of the National Automobile Chamber of Commerce. At this meeting Judge Edwin B. Parker, Priorities Commissioner, presided, assisted by Director of Steel Supply Replogle. In the discussion it was brought out that more than 80 per cent of the 400,000 motor trucks now in use in this country are engaged either directly or indirectly in war work. The remaining 20 per cent have a regular normal business use, which might be said to be indirectly contributory to war work, since no one operates a motor truck for pleasure.

This year's truck production schedule called for the building of 275,000 motor trucks, 50,000 of which will be required by the Government, while 40,000 will be required to replace those worn out in service. After exhaustive examination it has been found that on the average each motor truck moves 10 tons of freight per day, or a total of 4,000,000 tons is moved each day by the trucks now in service.

The War Industries Board has asked for informa-

tion concerning the amount of steel necessary for the construction of the truck manufacturers' program for the coming year. Among the items of information desired was the truck production for the United States Government and the Allies during the years 1916, 1917, and the first six months of 1918; second, the domestic production for the same period. Also it was asked how much steel was used for the production of both types of trucks, the amount of rubber used, and the amount of coal required to operate, as well as the amount of war work other than the manufacture of trucks done by the various factories.

The investigation of the special committee developed the fact that there are 144 firms engaged in the manufacture of trucks. They were divided into two classes: those that built more than 100 trucks during this two-year-and-a-half-period, and, second, those that did not. It was found that there were 101 manufacturers who had built more than 100 trucks during this period. These trucks ranged in size from one-half to seven tons. There were 276,477 trucks of all kinds built, and in their construction were used 492,129 tons of steel and 48,537 tons of rubber. This was an average of 1½ tons of steel per truck, and 200 lb. of rubber. It was further shown that at the present time there are in sight only 13,000 motor trucks, either already manufactured, in stock, or the material on hand to build them. This is ordinarily about one month's supply. Under present conditions they would hardly last that long.

The Truck as a Freight Carrier

The motor-truck men told Judge Parker and his associates that business men throughout the country are turning more and more to motor trucks to solve their freight problems, and that to-day the truck stands second only to the railroad and the steamboat as a means of transportation. In all sections truck freight lines are coming into existence, and those that have been in operation are expanding. In the short-haul work the motor truck has demonstrated the fact that it is more efficient than the railroad, and as illustrating this fact it was stated that between New York and Philadelphia 900,000 tons of freight a year is hauled by motor truck, and the service is steadily growing.

The motor-truck committee promised to prepare for the Priorities Commissioner a list of what may be considered essential industries entitled to purchase motor trucks, the understanding being that this list will be officially revised and ultimately made public.

Trucks as War Essentials

Upon the conclusion of the conference the War Industries Board gave out a formal statement as follows:

At a hearing before Edwin B. Parker, Priorities Commissioner, and other representatives of the War Industries Board, at which a committee representing the motor truck industry of the United States presented the claims of the industry to preference treatment in its supply of raw materials, especially steel and fuel, the following conclusions were tentatively reached:

1. That motor trucks, in so far as they are used directly or indirectly for war purposes, are war essentials, and their production must be facilitated accordingly.
2. That in so far as motor trucks are employed in civilian industries for essential uses they constitute an important transportation medium and their curtailment for such uses should be avoided as far as practicable.
3. That there exists in the industry, as in many others, an element of non-essentiality because of the uses to which its products are devoted, and a plan has been devised and will be put into effect promptly to insure against the manufacture or delivery of motor trucks for any other than essential uses. Regardless of the point of essentiality, how-

(Continued on page 245)

Iron and Steel Markets

WAR NEEDS AND CAPACITY

Government Demands Grow Constantly

Prospect for Less Essential Industries Not Helped by the Week's Developments

More impressively than in any previous week the Government has put before the steel producers the demands it will make upon the country's capacity in the next six months and the still greater needs of 1919. It is now realized that the ship program is to be increased next year beyond anything yet believed, that railroad purchases must far exceed those for 1918 after years of starvation buying, and that shell steel must be furnished at a 5,000,000-ton rate. Moreover, the strain great crops have always put upon iron and steel capacity is also to be reckoned with now.

In its third warning to consumers of steel within three months the War Industries Board put the needs of the second half of the year for war and essential industries at 20,000,000 tons of finished steel products, or 3,500,000 tons more than the expected output. A sharp challenge of the 20,000,000-ton estimate came from automobile interests, accompanied by a call for a definite assurance as to steel supply, even on a reduced scale. No assurance has been given, nor can it be given, the most certain thing in the prospect being that the use of steel for war purposes will increase, while production is less likely to increase. The week has brought a reminder that summer heat will yet be a factor.

The ability of iron and steel jobbers to replace their stocks is a moot question. Manufacturers generally rule that replacement orders can only be filled to the extent of shipments for war essentials in the preceding month. This policy points to a lessening percentage of warehouse business.

The existence of good sized stocks of steel in manufacturers' hands, amounting in the automobile industry to four or five months' supply in some cases, explains the absence of shutdowns with the gradual tightening of Government control, but points to some radical readjustments in the next few months.

Buying of finished steel has fallen off greatly, the Government policy being to keep about three months ahead of the mills. Accumulated orders may be expected to decline, therefore, but without signifying a change in operating prospects.

Among the smaller producers of pig iron the feeling grows that an advance in the price should be made for the fourth quarter. Virginia, Tennessee and eastern Pennsylvania furnaces are especially concerned in the agitation for zone prices. In case of a pig iron advance, if only for less favored producers, the claims of certain plate mills would be urged again.

With 100,800 tons of fabricated steel work put under contract in June, according to the records of the Bridge Builders and Structural Society, the fabricators are engaged at the rate which has obtained through the preceding five months of the year. Since the fabricated ship program got under way they

have taken 1,060,000 tons of work, or 117,500 tons monthly against 82,000 tons monthly for six months before ship contracting was a factor. The largest new undertaking involves 12,000 tons for the new Liberty shipyard of the Bethlehem Shipbuilding Corporation at Alameda, Cal., to be supplied by the McClintic-Marshall Co.

Measured in terms of the shortage and low efficiency of labor, the fabricators are nearer the limit of capacity than the figures indicate; accordingly they are not concerned over the dormant market in general building.

How well the steel makers have met shipbuilding demands is shown in the shipments from mills of 265,000 tons of material for the Hog Island yard and 197,000 tons for the Submarine Boat plant.

The survey of pig-iron consumption undertaken by blast furnace companies in June has been completed, with the result that nearly 300,000 tons of pig iron already under contract has been diverted to companies engaged on war or essential work. By way of fully clearing up the question, the Director of Steel Supply issued the statement that no priority certificates would be used for pig iron, though a large part of current shipments is directed from Washington.

Opposite policies prevail as to pig iron sales for next year. Most furnaces avoid such commitments, seeing that so much of their output is now subject to Government orders. In Ohio, however, particularly in Cleveland, large sales for 1919 have been made, though it is well understood that the iron may not be delivered as agreed.

A new deal is being made on the 180,000 tons of basic iron for England, only 95,000 tons being actually distributed thus far—65,000 tons to Northern and 30,000 tons to Southern furnaces. Machine cast metal was required and few Southern makers could supply it.

Even with the prodigious increase in tinplate output, plans for new capacity are announced. The Steel Corporation's plant at Gary will be more than doubled as quickly as the work can be put through.

Pittsburgh

PITTSBURGH, July 23.

Printed reports circulated last week to the effect that the prospects were better for an increased supply of finished steel products to jobbers and commercial users within a short time have been thoroughly discredited by developments from Washington in the last few days. The War Industries Board has very recently issued a statement to the effect that the requirements of the Government and essential industries for finished rolled steel in the next six months will be close to 20,000,000 tons and may possibly exceed that amount. This is a much larger output of finished steel than has ever been made in this country in any half-year period, and is certainly larger than the mills will be able to turn out up to Jan. 1 next. The fact is that the outlook for supply of finished steel products for jobbers and the commercial consumers is very discouraging. If this country can produce 18,000,000 tons of finished steel in the last half of this year, it will make a record greater by nearly 2,000,000 than that of any half-year period. The pressure under which the steel

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	July 23 1918	July 16 1918	June 25 1918	July 25 1917
No. 2 X, Philadelphia....	\$34.40	\$34.40	\$34.40	\$53.00
No. 2, Valley furnace.....	33.00	33.00	33.00	53.00
No. 2 Southern, Cincinnati.	36.90	36.90	36.90	49.90
No. 2, Birmingham, Ala....	33.00	33.00	33.00	47.00
No. 2, furnace, Chicago*....	33.00	33.00	33.00	55.00
Basic, deliv., eastern Pa....	32.90	32.90	32.90	50.00
Basic, Valley furnace.....	32.00	32.00	32.00	52.00
Bessemer, Pittsburgh.....	36.60	36.60	36.60	55.95
Malleable Bess., Ch'go*....	33.50	33.50	33.50	55.00
Malleable Valley.....	33.50	33.50	33.50	53.00
Gray forge, Pittsburgh....	33.40	33.40	33.40	46.95
L. S. charcoal, Chicago....	37.85	37.85	37.85	58.00

Rails, Billets, etc., Per Gross Ton:	July 23 1918	July 16 1918	June 25 1918	July 25 1917
Bess. rails, heavy, at mill.	55.00	55.00	55.00	38.00
O-h. rails, heavy, at mill.	57.00	57.00	57.00	40.00
Bess. billets, Pittsburgh....	47.50	47.50	47.50	100.00
O-h. billets, Pittsburgh....	47.50	47.50	47.50	100.00
O-h. sheet bars, P'gh.....	51.00	51.00	51.00	105.00
Forging billets, base, P'gh.	60.00	60.00	60.00	125.00
O-h. billets, Philadelphia.	51.30	51.30	51.30	110.00
Wire rods, Pittsburgh....	57.00	57.00	57.00	95.00

Finished Iron and Steel.

Per Lb. to Large Buyers: Cents	Cents	Cents	Cents
Iron bars, Philadelphia..	3.73	3.73	4.659
O-h. bars, Pittsburgh....	3.50	3.50	4.75
Iron bars, Chicago.....	3.50	3.50	4.50
Steel bars, Pittsburgh....	2.90	2.90	4.50
Steel bars, New York....	3.145	3.145	4.669
Tank plates, Pittsburgh..	3.25	3.25	9.06
Tank plates, New York...	3.495	3.495	10.169
Beams, etc., Pittsburgh...	3.00	3.00	4.50
Beams, etc., New York...	3.245	3.245	4.669
Skelp, grooved steel, P'gh.	2.90	2.90	4.00
Skelp, sheared steel, P'gh.	3.25	3.25	6.00
Steel hoops, Pittsburgh...	3.50	3.50	5.25

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

mills are working indicates that the expectation of the above-named output in the last half of this year stands a pretty good chance of being realized.

For some finished steel, commercial demand is showing some falling off, but this occasions no uneasiness, as any steel available by reason of falling off in demand for any particular product will be quickly diverted to some other product classed as a war essential. Vacations this year among manufacturers and employees will be much rarer than usual, the desire being to remain right on the job and see that every ton of steel is made that can be turned out.

Pig Iron.—Several weeks ago, the Committee on Pig Iron, Iron Ore, and Lake Transportation allocated the 180,000 tons of basic iron wanted by England, 100,000 tons having been given to Southern blast furnaces and 80,000 tons to Northern blast furnaces. However, recently some unexpected conditions arose, which made it necessary to ship part of this iron promptly, with the result that a reallocation has been made of the iron, and Northern furnaces have been given 65,000 tons and Southern furnaces 30,000 tons, the expectation being that this 95,000 tons of iron will be shipped in the next two or three weeks, the other 85,000 tons to be shipped as originally planned in September, October and November. The committee that had in charge the recent survey of the pig-iron trade reports that it has been completed, the questionnaires having been returned by every company to which they were sent, and the questions fully answered. The survey has resulted in close to 300,000 tons of iron under contract to certain consumers being allocated to companies working on strictly war essentials. Two or three important questions affecting the distribution of pig iron to certain consumers, notably ingot mold makers, have lately come up for adjustment by the Director of Steel Supply. Some inquiries are in the market for pig iron, and when these are received by the blast furnaces, they simply notify the parties wanting iron that they have referred their inquiries to Washington for attention. The output of pig iron in July in the Pittsburgh district is expected to be larger than in June, which was a record month. The growing scarcity in supply of heavy steel scrap for open-hearth use, is reflected in pig iron, which seems to be getting scarcer in this dis-

Sheets, Nails and Wire.

Per Lb. to Large Buyers: Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	5.00	5.00	8.50
Sheets, galv., No. 28, P'gh.	6.25	6.25	10.00
Wire nails, Pittsburgh....	3.50	3.50	4.00
Cut nails, Pittsburgh....	4.00	4.00	4.65
Fence wire, base, P'gh....	3.25	3.25	3.95
Barb wire, galv., P'gh....	4.35	4.35	4.85

Old Material, Per Gross Ton:

Carwheels, Chicago.....	\$29.00	\$29.00	\$29.00	\$32.00
Carwheels, Philadelphia..	29.00	29.00	29.00	35.00
Heavy steel scrap, P'gh....	29.00	29.00	29.00	36.00
Heavy steel scrap, Phila..	29.00	29.00	29.00	32.00
Heavy steel scrap, Ch'go..	29.00	29.00	29.00	30.00
No. 1 cast, Pittsburgh....	29.00	29.00	29.00	32.00
No. 1 cast, Philadelphia..	29.00	29.00	29.00	35.00
No. 1 cast, Ch'gh, net ton.	28.25	28.00	27.50	28.50
No. 1 RR. wrot., Phila....	34.00	34.00	34.00	48.00
No. 1 RR. wrot., Ch'go, net.	29.75	29.75	29.75	35.00

Coke, Connellsville, Per Net Ton at Oven:

Furnace coke, prompt....	\$6.00	\$6.00	\$6.00	\$11.00
Furnace coke, future....	6.00	6.00	6.00	10.00
Foundry coke, prompt....	7.00	7.00	7.00	13.00
Foundry coke, future....	7.00	7.00	7.00	10.00

Metals.

Per Lb. to Large Buyers: Cents	Cents	Cents	Cents
Lake copper, New York....	26.00	26.00	23.50
Electrolytic copper, N. Y..	26.00	26.00	23.50
Spelter, St. Louis.....	8.37 1/2	8.50	8.37 1/2
Spelter, New York.....	8.62 1/2	8.75	8.62 1/2
Lead, St. Louis.....	7.75	7.75	7.75
Lead, New York.....	8.05	8.05	7.82 1/2
Tin, New York.....	94.00	94.00	92.00
Antimony (Asiatic), N. Y.	13.25	13.00	13.00
Tin plate, 100-lb. box, P'gh	\$7.75	\$7.75	\$7.75

trict. No stocks of iron are piled at furnaces or in millyards, but the output is being used as melted. We quote:

Basic pig iron, \$32; Bessemer, \$35.20; gray forge, \$32; No. 2 foundry, \$33; No. 3 foundry, \$32.50, and malleable, \$33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being \$1.40 per ton.

Billets and Sheet Bars.—The acute shortage in supply of sheet bars for the tin plate and sheet mills still exists, but hope is held out for a larger supply of bars in the near future, owing to the fact that the shipyards and other users of plates are pretty well stocked, and this may release in the near future some steel for sheet bars that is not now available. Two Youngstown mills that formerly were very large producers of sheet bars for regular customers, not only had to cut off most of these customers from their books, but to the few companies they still retained, they are shipping much less steel than usual. Nearly all sheet bars are rolled from Bessemer steel, the output of the open-hearth mills being needed for strictly war essentials.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at \$47.50, sheet bars \$51, forging ingots \$73, and forging billets \$60 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Ferroalloys.—Local dealers in ferroalloys report that inquiry is light, and state that nearly all consumers are covered on their needs for this year. Some time ago, there was a shortage in supply of 50 per cent ferrosilicon, but this has been overcome, and there is plenty to go around and available for prompt shipment. We note a sale of about 200 tons of 70 per cent ferromanganese for delivery over last half at \$250 per gross ton, delivered. The War Industries Board has ruled that the lower content for ferromanganese, 70 per cent, and for spiegeleisen, 16 per cent, applies only to the domestic product. Makers of the lower grades of Bessemer ferrosilicon, and also silvery iron, report they are sold up for the remainder of this year.

We quote 70 per cent ferromanganese at \$250 delivered. 16 per cent spiegeleisen at \$65 to \$70 at furnace and 50 per cent ferrosilicon for prompt shipment at \$160 and for delivery over the last half of the year, \$150 to \$155 at furnace, the furnaces usually absorbing the freight.

We now quote 9 per cent Bessemer ferrosilicon at \$54; 10 per cent, \$55; 11 per cent, \$58.30; 12 per cent, \$61.60. We quote 6 per cent silvery iron, \$41; 7 per cent, \$43; 8 per cent, \$45.50; 9 per cent, \$47.50; 10 per cent, \$50. Three dollars per gross ton advance for each 1 per cent silicon for 11 per cent

and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, these furnaces having a uniform freight rate of \$2 per gross ton, for delivery in the Pittsburgh district.

Structural Material.—Probably 90 per cent of all the new structural work being placed is Government essential work, very few commercial jobs being in the market. The McClintic-Marshall Co., has taken 2000 tons for a Government storage building in the East, and 1200 to 1500 tons for another Government building in the South. The American Bridge Co., has taken 6000 tons of Government work at one point and 3000 to 4000 tons at another location, also about 400 tons of bridge work for the Pennsylvania Railroad. These two concerns report that over 90 per cent of all the structural work they have on their books is for the Government, and that they are loaded up with work, already taken and in sight for nearly a year. We quote beams and channels up to 15 in. at 3c. at mill, Pittsburgh, for third-quarter delivery.

Plates.—In order to give to the Government every ton of plates it possibly can, the Carnegie Steel Co. is installing a large amount of new equipment in the plate mills at its Homestead Steel Works, and also at several other mills making plates, this consisting of new heating furnaces, shears, roller tables, etc. The report that the Carnegie company was building a new plate mill at its Homestead Works is incorrect. The company hopes by Jan. 1, or very shortly after, to be able to turn out fully 10,000 tons of plates per month more than it is now making. Advices are that the shipyards are well filled with plates for several months, and several have asked the mills to slow down in shipments until the heavy stocks of plates on hand have at least been partly worked off. However, with the large program given out lately by the War Industries Board as to Government needs of steel for this year, it would seem that the present large output of plates will be amply taken care of by Government works. The plates and shapes for the Government cars have all been placed, the Carnegie Steel Co. furnishing the greater part of the plates and shapes for the cars to be built by the Pressed Steel Car Co., and the Standard Steel Car Co. The demand for ship plates is still heavy, and mills are sold up for many months. We quote $\frac{3}{4}$ in. and heavier sheared plates for third quarter delivery at 3.25c. at mill, Pittsburgh.

Wire Rods.—The Sub-Committee on Wire Products has allocated recently 11,000 tons of soft wire rods for shipment to France, and later 14,000 tons for England. Of this business, a local mill took about 2000 tons, while another mill stated it had no rods to spare, and if it was compelled to take part of the order it would have to take the steel from the manufacturers of plates and other essentials. Local hot mills are not operating to more than 50 to 60 per cent on account of the demands for their steel for other war essentials. The commercial demand is active and rods for general use are very hard to find. A local mill has recently made several sales of high-carbon rods at prices ranging from about \$80 to \$90 at mill. Prices on rods for third quarter are given on page 237.

Wire Products.—On July 19, at Washington, the War Industries Board opened bids on 27,420 kegs of wire nails, 16d to 60d, and also on 2500 kegs of staples. It is reported the entire order will go to a local company, which was the lowest bidder, but this is not confirmed. It is said the regular price of \$3.50 base per keg was bid on the nails, 10c. extra for the cleats and 10c. extra per keg for the paper in which the nails were packed in the keg. There is still some confusion here as to the exact course to be pursued in the selling of nails and wire by the mills to jobbers. Several mills report they are not making sales to jobbers, as the blank forms to be used by the latter have not been supplied. Another mill states it is taking jobbers' orders only to replace material shipped out in the previous month and on war essentials. Jobbers' stocks are low, and it is evidently the intention of the War Industries Board that they are not to be increased. The general demand for nails and wire is heavy from all over the country, and local mills are turning down orders nearly every day, stating that on Government direct and indirect orders they are well sold up for

three or four months. Prices on wire product for this quarter are given on page 237.

Cotton Ties.—Practically all the cotton ties to be made this year are under contract, and two local makers state that in spite of the shortage in steel, they fully expect to make as many cotton ties as last year. Prices on cotton ties for July shipment are \$1.93 per bundle of 45 lb. f.o.b. Pittsburgh, and \$1.94 for August delivery.

Shafting.—Makers report that on the larger sizes ranging from 1½ to 5 in., used largely in making war essentials, they are sold up for three to four months, but the demand for the smaller sizes is light. Output of shafting is not more than 75 per cent of normal on account of the shortage in steel. Orders from the automobile and screw stock machine trades are few. We quote cold-rolled shafting at 17 per cent off in carloads and 12 per cent in less than carloads, f.o.b. Pittsburgh for third quarter.

Nuts and Bolts.—Almost every day the Government is placing orders for nuts and bolts, and the demand is so urgent for shipyard and other purposes that very close to 50 per cent of the output is shipped by express instead of freight. A local maker shipped two or three carloads of nuts and bolts last week by express. As a result of the meeting of the nut and bolt makers had here recently, the distribution of Government orders is being done in the same methodical way, and considerable saving in time of delivery and in other ways being effected and still more improvement in this direction is expected. Only a small part of the output of nuts and bolts is available for jobbers and in all cases they are required to furnish certified copy of the pledges sent to Washington. A large maker states that 85 to 90 per cent of the output of nuts and bolts is going to the Government on direct and indirect orders, and the Pittsburgh Screw & Bolt Co. is furnishing to the Government 100 per cent of its output. Discounts on nuts and bolts for third quarter are given on page 237.

Rivets.—Makers report a very heavy demand for ship rivets, on which they are sold up for some months. Fully 75 per cent or more of the output of rivets is going to the Government, and deliveries of steel to the makers are good. We quote cone-head structural rivets at \$4.40 and cone-head boiler rivets at \$4.50 per 100 lb. Smaller rivets, 50 and 10 per cent off list f.o.b. Pittsburgh for third quarter.

Hoops and Bands.—Mills report the demand for hoops for cooperage purposes very active, and they are sold up for several months. The demand for steel bands is fair, but output is cut down very much because of shortage in supply of steel. Both hoops and bands are available in limited quantities for commercial trade when priority certificates are furnished with the orders.

Iron and Steel Bars.—Mills rolling soft steel bars report that on Government direct and indirect orders, their output is fully taken care of for the remainder of this year. Specifications against contracts from implement makers and other consumers of steel bars that are working on war essentials are very active. The mills rolling iron bars are not so busy, but have a fair amount of work ahead, mostly for the Government. Some bar iron mills that have some spare rolling capacity have taken up war essentials for the Government. The demand for high-carbon iron bars is reported heavy. We quote soft steel bars rolled from billets at 2.90c., from old steel rails 3c., and refined iron bars 3.50c. at mill Pittsburgh, for third quarter delivery.

Tin Plate.—The report is confirmed that the American Sheet & Tin Plate Co. is to build another tin mill at Gary, Ind., to contain 12 double, or 24 single, hot tin mills, and to have an annual capacity of about 2,250,000 base boxes of tin plate. It is not expected the mill will be ready for operation before early in 1919. The tremendous demand for tin plate for the Government was a prime factor in the decision reached by the officials of the American Sheet & Tin Plate Co. to build this mill. Output of tin plate is still in excess of 95 per cent of capacity, and for July is expected to

amount to about 3,250,000 base boxes. There is little worry about the supply of pig tin for this year, but some makers of tin plate believe there may be trouble in getting a full supply for next year. The Subcommittee on Pig Tin has not yet worked out its plan of acquiring the supply of tin plate, and in fixing a standard price, about 70c. per lb., but may be able to do this in a short time. We quote tin plate for third quarter at \$7.75 per base box f.o.b. Pittsburgh, made from Bessemer or open-hearth stock. Prices onterne plate for third quarter are given on page 237.

Sheets.—Reports are that orders now on the books of the sheet mills from the Government on direct orders, also from commercial users and on indirect orders, run considerably over 800,000 tons, but this is not officially confirmed. It is stated, however, that the sheet mills, counting the Government and commercial business on their books, have over four months work ahead. Orders from the Government for sheets have been light lately, but some large business is in sight that may come out in a short time. The commercial demand is only fairly heavy, and jobbers are unable to place orders for sheets with the mills unless they furnish priority orders or a certified copy of the pledge sent to Washington. It is said the independent sheet mills are operating at present to not over 65 per cent of capacity, due to the scarcity in supply of sheet bars. The American Sheet & Tin Plate Co. is operating its sheet mills at less than 50 per cent of capacity. Prices on sheets are given in detail on page 237.

Spikes.—Local makers have no advice of any direct inquiry for railroad spikes from the Railroad Administration, but expect some large inquiries will come out from this source in the near future. The demand for standard spikes has been very dull for some time and railroads are buying only a few hundred kegs at a time. Smaller spikes are very active, especially from coal mines, and makers are sold up on these for two or three months. The move to have the railroads adopt a standard type of spike will no doubt be taken up by the Railroad Administration actively before it places orders. The makers insist that this would be a very economical move. We quote:—

Standard sizes of railroad spikes 9/16 x 4 1/2 in. and larger, \$2.20 per 100 lb. in lots of 200 kegs of 200 lb. each, or in larger lots. Boat spikes, \$5.25 per 100 lb., track bolts, \$4.90 base in lots of 200 kegs or more; less than 200 keg lots, \$1 per 100 lb. extra. All f.o.b. Pittsburgh.

Hot-Rolled Strip Steel.—The demand is only fairly active, no large orders from the Government having been placed for some time. The scarcity in steel is reducing output of hot-rolled strip steel to a considerable extent, and several makers are not running to more than 60 per cent of capacity. We quote hot-rolled strip steel at \$3.50 per 100 lb. f.o.b. Pittsburgh, with 50c. additional per 100 lb. for special stamping quality, f.o.b. Pittsburgh.

Cold-Rolled Strip Steel.—No large orders have come out from the Government for some time, and makers report that commercial demand is only fairly heavy. Operations of the cold-rolled strip mills, owing to the scarcity of steel, are only about 60 to 70 per cent of capacity. We quote:

We quote cold-rolled strip steel at \$6.50 per 100 lb. f.o.b. Pittsburgh, terms 30 days, less 2 per cent for cash in 10 days when sold in quantities of 300 lb. or more. Freight is allowed to destination when it does not exceed 31c. per 100 lb.

Skelp.—None of the mills rolling skelp has any material to sell for delivery this year, and one large maker is reported sold up over practically the first half of next year.

We quote grooved skelp at \$2.90; universal skelp, \$3.15, and sheared skelp, \$3.25 base. Special skelp for boiler tubes, etc., is \$3.10 for base sizes and \$3.55 for other sizes, all prices being per 100 lb., f.o.b. Pittsburgh.

Wrought Pipe.—Some fairly large orders for the lighter grades of pipe suitable for making gas bombs have been placed with Youngstown and local mills. This will be rolled and shipped to France as promptly as possible. Mills rolling iron and steel pipe are sold up for some months, probably 90 per cent of the output going to the Government on direct and indirect orders. Leading makers of steel pipe say they have nothing to sell until July, next year, or later. Discounts on iron and steel pipe are given on page 237.

Boiler Tubes.—Mills rolling iron and steel tubes and also companies making seamless steel tubing are filled up for many months, mostly on Government orders. The demand for oil country goods is also very active, and new oil development work is heavy. The Government desires that every means be used to increase the output of crude oil, and to meet this demand drilling in Oklahoma, Texas and other oil producing States is very active. Discounts on iron and steel tubes are given on page 237.

Coke.—As yet, very little free coke is available, the active demand for furnace and foundry taking the entire output of coke as fast as it is made. Production in the two Connellsville regions is still far from being normal, as under ordinary conditions they would turn out close to 450,000 tons per week, while output for some time has been running from 340,000 to 350,000 tons per week. Some contracts have been made for 7 1/2-hr. foundry coke, but none for furnace, and there is no incentive to make contracts for the latter. On some contracts made for foundry coke, a clause is inserted to the effect that if Government regulation of prices should end before the contracts are filled, the prices to be paid on any unshipped tonnage shall be those in effect at the time the contracts were made. Output of coke in the upper and lower Connellsville regions for the week ending July 13 was 353,470 tons, an increase over the previous week of 3574 tons. We quote 48-hr. furnace coke at \$6, 72-hr. foundry at \$7, and crushed, from 1-in. size, at \$7.35, these being Government prices and all in net tons at oven.

Old Material.—The amended specifications on low-phosphorus steel scrap and cast iron scrap as made recently by the Committee on Steel and Steel Products do not make any change in the base prices. Recently a move was started by scrap dealers to round up any available scrap, and at any location, and it is said that while considerable scrap was unearthed, it is located at very unaccessible points on which freight rates to consuming points would be very high. Whether it will be moved or not has yet to be settled. There is a great scarcity in supply of steel-making scrap, and consumers are accepting material that is not up to standard quality, and which under ordinary conditions they would very quickly reject. Some of the mills are still buying scrap in outside districts, and paying the extra freight under a permit from the scrap committee, but the chances for securing scrap material in this way are not very numerous. The Neville Island plant of the Ordnance Department, United States Steel Corporation, will likely be a very heavy consumer of low-phosphorus melting stock in its open hearth furnace. We note sales of 6000 to 8000 tons of heavy melting steel scrap at \$29, also 2000 to 3000 tons of low-phosphorus melting stock, consisting of bloom and billet ends and plate shearings at \$39, delivered, and 1000 to 1200 tons of borings and turnings at \$19 delivered to consumers' mills, plus the 3 1/2 per cent commission to dealers.

Heavy steel melting scrap, Steubenville, Folsom, Brackenridge, Monessen, Midland and Pittsburgh, delivered	\$29.00
No. 1 cast scrap (for steel plants)	29.00
Re-rolling rails, Newark and Cambridge, Ohio, Cumberland, Md., Franklin, Pa., and Pittsburgh	34.00
Hydraulic compressed steel scrap	29.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mills, Pittsburgh district	\$27.50 to 29.00
Bundled sheet stamping scrap	22.00 to 23.00
No. 1 busheling scrap	28.00 to 29.00
Railroad grate bars	18.00 to 19.00
Low phosphorus melting stock (unguaranteed)	34.00
Low phosphorus melting stock (guaranteed)	36.50
Low phosphorus melting stock (bloom and billet ends, heavy plates)	39.00
Iron car axles	46.00 to 46.50
Locomotive axles, steel	46.00 to 46.50
Steel car axles	46.00 to 46.50
No. 1 busheling scrap	28.00 to 29.00
Machine shop turnings	19.00
Cast iron wheels	29.00
Roller steel wheels	35.00
Sheet bar crop ends (at origin)	35.00
Cast iron borings	19.00
No. 1 railroad wrought scrap	34.00
Heavy steel axle turnings	24.00
Heavy breakable cast scrap	28.00 to 29.00

Chicago

CHICAGO, July 22.—(By Wire.)

Not all the jobbers in steel seem to understand that they cannot renew their stocks by merely pledging themselves to keep all the steel they handle in war channels. They appear to believe that simply signing the pledge insures their supply, whereas they can only replace what they sold in the previous month, and they have no license to demand in excess of what they sold to essential industries, as some are doing. Some have been hampered by failing to receive the official blanks on which they are to specify the tonnage to which they are entitled and why they should have it.

At the request of the Government, standard section rails are to have a better show in rollings, even at the expense of other much needed products.

The pig iron situation continues to present some knotty problems, as in the case of a large consumer which has stock in hand for present needs but seeks to protect last-half needs and applied to Washington for allocation. The advice received was to apply to its regular source of supply, in this case a Southern furnace. To the Southern furnace it went with a statement and classification of its needs, showing that much Government work, direct and indirect, was in hand. The Southern furnace pointed out that its iron had been allocated for the remainder of the year. So Washington will be appealed to again and the statement and classification be presented. It is persistently reported that at least 60,000 tons of basic for export has been allocated in the South, each of two companies taking 30,000 tons.

Ferroalloys.—The market continues quiet. We quote 70 per cent ferromanganese at \$250 delivered; 50 per cent ferrosilicon at \$150 to \$160 delivered, and spiegel-eisen, 16 to 18 per cent, at \$75, furnace.

Plates.—The leading producer is applying nearly all its production against ship and car requirements, and the leading independent continues to roll for delivery to Japan. Jobbers continue to have their troubles, except where they replace lots sold to war industries. The jobbers have suffered some delay in getting steel stocks owing to failure in receiving the official blanks on which they are to state their requirements.

The official mill quotation is 3.25c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers who have stock quote 4.52c.

Pig Iron.—Melters in general have enough iron with which to carry on current operations, but some of them are not sure how they will fare when their present stocks are exhausted. The furnaces are extremely cautious about their future commitments, if they are not fully booked—while some of them see no free iron for the remainder of the year, this being particularly true of some of the larger Southern producers with whom the situation is made worse by labor shortage and uncertainties of production. A Northern interest is taking on business for the first half of next year, the deliveries, of course, being subject to Government approval. How efforts to restock are working out in some cases is illustrated by the experience of a maker of radiators, etc. It has many Government orders at its several plants, but when it applied to Washington for the allocation of iron it was advised to go to its regular source of supply. It did so, sending along a detailed statement and classification of its orders, but the furnace concerned said it had all it could do in caring for the iron already allocated to it by the Government. Some of the Southern furnaces not only are well booked for the last half, but they are carrying a considerable tonnage of unfilled first-half orders over into that period. A short time ago, when it was put up to the furnaces to see that their product was properly distributed, it was expected that they would be governed by the returns of the questionnaire sent to both producers and consumers, but a difficulty that has arisen in respect to this course is that foundry order books have changed considerably since the situation was scanned, and many foundries will need much more iron than was then apparent. It is generally admitted that practical iron men can effect a better distribution

than could a Government bureau inasmuch as such distribution is the lifelong work of the pig iron trade. At the same time, it is evident that there are some rough places to be smoothed out. It is understood that some founders have been asked for sworn statements of their non-essential needs. It is reported that a plant is to be built at Clearing, near Chicago, for the casting of shells and that 10,000 tons of Bessemer iron has been or is about to be allocated for that purpose.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable, and steel-making irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5.....	\$38.00
Lake Superior charcoal, No. 6 and Scotch	\$39.50 to 41.00
Northern coke foundry, No. 1.....	33.50
Northern coke foundry, No. 2.....	33.00
Northern coke foundry, No. 3.....	32.50
Northern high-phosphorus foundry.....	33.00
Southern coke, No. 1 foundry and No. 1 soft..	39.50
Southern coke, No. 2 foundry.....	38.00
Malleable	33.50
Basic	32.00
Low phosphorus (copper free).....	53.00
Silvery, 7 per cent.....	46.20

Structural Material.—A local mill last week put its structural mill on a rush order for shell steel. All that is true of plates applies to shapes for the present, although bookings are not so heavy as for the former. The Kansas City Structural Steel Co. will fabricate 203 tons of miscellaneous material for the Kansas City Southern Railroad. A highway bridge over the Santa Margarita River, near Oceanside, Cal., will go to reinforced concrete.

The official mill quotation is 3c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 4.27c. for material out of warehouse.

Bars.—Only on priority orders can mild steel bars be obtained. The bar-iron business is holding up, but is not showing any considerable improvement. Orders for rail-carbon bars are taken only as the reolling rails are obtainable, and some makers are so behind in shipments that they want no business.

We quote, mill prices, mild steel bars at 2.90c., Pittsburgh, taking a freight rate to Chicago of 27c. per 100 lb. Bar iron is quoted at 3.50c., Chicago, and rail carbon at 3c. Chicago, a leading maker having adhered to Chicago as the basing point. Jobbers' prices follow:

Soft steel bars, 4.17c.; bar iron, 4.17c.; reinforcing bars, 4.17c., base. No extra charge for twisting $\frac{3}{4}$ -in. and over; 24c. for twisting $\frac{5}{8}$, 11/16, $\frac{1}{2}$ and 9/16; 5c. for 7/16 and $\frac{3}{4}$; 10c. for 5/16 and 15c. per $\frac{1}{4}$ -in. Extras as per card are charged for small sizes. Shafting, list plus 13 per cent.

Sheets.—Industries entitled to priority or classed among those entitled to preference are being served to a considerable extent, but there is a lot of business awaiting Government authority. We quote:

Chicago delivery out of stock, regardless of quantity. No. 10 blue annealed, 5.52c.; No. 28 black, 6.52c., and No. 28 galvanized, 7.77c.

Bolts and Nuts.—The pressure of demand is as great as ever, and manufacturers are concerned as to how far they will be able to get raw material wherewith to fill their commitments, although only preferred work is figured on. For prices and freight rates see finished iron and steel f.o.b. Pittsburgh. Jobbers quote:

Structural rivets, 5.67c.; boiler rivets, 5.77c.; machine bolts up to $\frac{3}{4}$ x 4 in., 37 $\frac{1}{2}$ per cent off; larger sizes 25 and 5 off; carriage bolts up to $\frac{3}{4}$ x 6 in., 32 $\frac{1}{2}$ off; larger sizes, 20 off; hot pressed nuts, square, tapped, \$1.05 off; hexagon, tapped 85c. per 100 lb.; coach or lag screws, gimlet points, square heads, 40 per cent off.

Rails and Track Supplies.—At the request of the Government, as already intimated, more attention is to be given by the mills to the production of rails, of which the roads are in dire need. It can only be done at the expense of other products. We quote:

Standard railroad spikes, 4.11 $\frac{1}{4}$ c., Chicago. Track bolts, with square nuts, 5.11 $\frac{1}{4}$ c., Chicago. Tie plates, steel, 3.25c.; tie plates, iron, 3.75c.; f.o.b. maker's mill. The base for light rails is 3c., f.o.b. maker's mill for 25 to 45-lb. sections, lighter sections taking Government extras.

Cast Iron Pipe.—Kansas City, Mo., awarded 2500 tons on which it took quotations to the United States Cast Iron Pipe & Foundry Co. The Government is placing between 700 and 800 tons it requires for a marine plant in South Carolina.

Wire Products.—While the makers are caring for their customers, including the jobbers, to the best of

their ability, they are still expecting an official modification of the method of distribution. For prices see finished iron and steel f.o.b. Pittsburgh, page 237.

Old Material.—The demand, especially for heavy melting and shovelling steel, is lively, but material is scarce. A local mill which has been inactive as a buyer of steel has come into the market at the full price plus a commission. More steel scrap should be coming out, and that it is not is charged to indifference which should not exist at this time, as a continuance of this attitude may lead to a serious shortage. Small lists have been issued by the Burlington, the Rock Island, the Chicago & Great Western and Lake Erie & Western.

We quote for delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Old iron rails	\$39.00
Relaying rails	\$55.00 to 60.00
Old carwheels	29.00
Old steel rails, rerolling	34.00
Old steel rails, less than 5 ft.	34.00
Heavy melting steel	29.00
Frogs, switches and guards, cut apart	29.00
Shovelling steel	29.00
Steel axle turnings	24.00
Per Net Ton	
Iron angles and splice bars	\$34.52
Iron arch bars and transoms	41.50
Steel angle bars	30.36
Iron car axles	41.52
Steel car axles	41.52
No. 1 railroad wrought	\$29.75 to 30.36
No. 2 railroad wrought	27.75 to 28.25
Cut forge	28.25 to 28.75
Pipes and flues	24.50 to 25.00
No. 1 busheling	26.25 to 26.75
No. 2 busheling	18.00 to 18.50
Steel knuckles and couplers	30.36
Coil springs	30.36
No. 1 cast scrap	28.25 to 28.75
Boiler punchings	32.00 to 33.00
Locomotive tires, smooth	40.50 to 41.52
Machine-shop turnings	15.75 to 16.25
Cast borings	16.50 to 16.96
Stove plate and light cast scrap	23.50 to 24.00
Grate bars	23.75 to 24.25
Brake shoes	24.00 to 24.50
Railroad malleable	30.36
Agricultural malleable	29.00 to 30.00
Country mixed scrap	21.00 to 21.50

Birmingham

BIRMINGHAM, ALA., July 22.

Pig Iron.—Federal experts and inspectors are expected in the Birmingham district during the week and upon their arrival, steps will be taken for the manufacture of basic iron for the English Government. There is probability of re-arrangement of original allocations, which were 40,000, 30,000 and 15,000 tons respectively for three interests. Those in touch with the allocating authorities say the entire tonnage to be made in Alabama will approximate 100,000. The Sloss-Sheffield Steel & Iron Co. will probably place two stacks on this basic and the Alabama Co. one. The Woodward Iron Co. is already making basic at three stacks and will probably continue to do so. The majority of the Woodward basic now on order books is understood to be for the United States Government. The manufacture of this amount of basic will further reduce the foundry capacity of the last half and it is beginning to be predicted that there will be nothing left for the non-essentials. The inquiry for 1919 delivery has increased, but booking of orders has not resulted. The making of memorandums with the understanding with regular customers that if they shall be on war work in 1919, the iron will doubtless be forthcoming is apparently as far as producers have gone. A large company has issued notices to its customers informing them of the necessity of getting on a war basis if they desire to be protected in 1919, and they are urged to do so. Protection of regular customers is being made a matter of special moment. Furnace practice ought to improve with the improvement in the coal output noted here and there are indications of this improved output increasing under pressure of constant personal appeal. Miners have been apprised that they will be exempt from war service upon appeal to and approval of local exemption

boards, which approval they will not secure except upon a good working report. Indications point to at least a continuance of present iron consumption in the South owing to change from non-essential to war basis, which is taking place constantly and will be on a still broader scale since the Birmingham district and Washington have gotten into close touch with one another through the zone 13 industrial board. We quote, per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry and soft	\$33.00
Basic	32.00

Cast Iron Pipe.—Very little new business has arisen and what has come is for cantonment and other Government purposes. Sanitary shops have, however, taken on considerably more war work in the way of castings.

Coal and Coke.—Searles and Brookwood mines of the Alabama Co. showed an increased output recently and the de Bardeleben mines have done likewise. A number of camps have taken the pledge to work six days per week and eight hours per diem following personal patriotic appeal. The coke output lags, especially in beehive ovens, where very little 72-hr. coke is any longer made.

Old Material.—Scrap dealers would like to see the market improve as to prices in several particulars, but they have not been able to secure advances in some time. There is a fair supply of cast and heavy melting steel, which is absorbed in the South. We quote, per gross ton, f.o.b. Birmingham district yards, prices to consumers as follows:

Old steel axles	\$35.00 to \$36.00
Old steel rails	28.00 to 28.50
Heavy melting steel	25.00 to 26.00
No. 1 railroad wrought	30.00 to 32.00
No. 1 cast	27.50 to 28.50
Old carwheels	29.00 to 29.50
Tramcar wheels	26.00 to 26.50
Machine shop turnings	15.00 to 16.00
Cast iron borings	15.00 to 16.00
Stove plate	23.00 to 23.50

Options have been secured on several hundred acres of land adjoining the properties of the Sloss-Sheffield Steel & Iron Co. in North Birmingham, Ala., and early beginning of assemblage and structural work on the new by-product plant is expected.

St. Louis

ST. LOUIS, July 22.

Pig Iron.—Transactions in pig iron continue at a minimum, as is to be expected, because of the short supply and the inability of foundries running on domestic work to get priority orders for material. The regional survey of plants in the St. Louis district and the more definite efforts on the part of foundries to get Government work are resulting in the placing of new contracts, but these have not been on the books long enough to affect materially the pig iron shipments under the necessary priority orders and in consequence the foundries are not as yet showing much increase in activity. The larger iron and steel industries of this district are well supplied with Government work and are in the market for almost unlimited quantities of pig iron, especially the Commonwealth Steel Co., the Scullin Steel Co., the American Steel Foundries and the National Enameling & Stamping Co. Basic, as well as foundry iron, is wanted in large quantities ranging from 10,000 to 40,000-ton lots. Stove foundries are also in need of pig iron, and a considerable tonnage could be disposed of to these plants if available.

Coke.—No business is being done in coke, the oven representatives being entirely sold upon allotments from their principals, both as to metallurgical and domestic coke. The chief efforts continue to be directed to getting allotted shipments in, so that operations can be kept as even as possible.

Finished Iron and Steel.—No contracts are being made, shipments to domestic consumers are practically nil and all except vital work or Government work is being held up for better times in the material supply.

Warehouses are continuing to censor calls for material very carefully and no material is being released without excellent reasons for the use thereof. Some difficulty is experienced in getting supplies even for such needs, but no serious troubles have been caused. For stock out of warehouse we quote as follows: Soft steel bars, 4.24c.; iron bars, 4.24c.; structural material, 4.34c.; tank plates, 4.59c.; No. 8 sheets, 5.54c.; No. 10 blue annealed sheets, 5.59c.; No. 28 black sheets, cold rolled, one pass, 6.59c.; No. 28 galvanized sheets, black sheet gage, 7.84c.

Old Material.—The situation in the scrap market has continued to be one of uncertainty, with a considerable demand developing and practically no material available, while the switching rate trouble seems to be in *statu quo*, although the shippers have hopes that their contention as to the increase in the charge will be recognized by the Government officials and the action of the local officers reversed. Rolling mills and steel plants are evidencing the sharpest demand for material, while the foundries are not strongly in the market because of the minimum of domestic work and the short supply of Government work at present on their books. Efforts to increase the utilization of local foundries on Government work are being pressed, and as the regional survey of industries progresses it is likely that more plants will be turned to war work among the smaller concerns than hitherto. All the larger consumers are well filled with military work, and this accounts for their demand for scrap in conjunction with the foundry grades of pig iron which are also being sought. The only list of consequence out during the week was one of about 250 tons from the St. Louis and San Francisco system. Most of the roads are offering small lots from day to day as they accumulate or can be picked up with the short labor supply, and this constitutes the basis of most of the current operations. Dealers report that an increasing number of consumers is showing a willingness to pay Government prices and commission. We quote dealers' prices, f.o.b. customers' industrial works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	\$37.00 to \$37.50
Old steel rails, rerolling	33.50 to 34.00
Old steel rails, less than 3 ft.	31.00 to 31.50
Relaying rails, standard sections, subject to inspection	55.00 to 65.00
Old carwheels	28.50 to 29.00
No. 1 railroad heavy melting steel scrap	28.50 to 29.00
Heavy shoveling steel	27.00 to 27.50
Ordinary shoveling steel	26.50 to 27.00
Frogs, switches and guards, cut apart	28.50 to 29.00
Ordinary bundled sheet scrap	23.00 to 23.50
Heavy axle and tire turnings	20.50 to 21.00
Per Net Ton	
Iron angle bars	\$33.00 to \$33.50
Steel angle bars	27.00 to 27.50
Iron car axles	40.00 to 40.50
Steel car axles	40.00 to 40.50
Wrought arch bars and transoms	40.00 to 40.50
No. 1 railroad wrought	28.50 to 29.00
No. 2 railroad wrought	27.50 to 28.00
Railroad springs	29.50 to 30.00
Steel couplers and knuckles	29.50 to 30.00
Locomotive tires, 42 in. and over, smooth inside	37.00 to 37.50
No. 1 dealers' forge	26.00 to 26.50
Cast iron borings	16.25 to 16.75
No. 1 busheling	25.50 to 26.00
No. 1 boilers, cut to sheets and rings	22.50 to 23.00
No. 1 railroad cast scrap	25.50 to 26.00
Stove plate and light cast scrap	21.50 to 22.00
Railroad malleable	26.00 to 26.50
Agricultural malleable	25.00 to 25.50
Pipes and flues	23.00 to 23.50
Heavy railroad sheet and tank scrap	22.50 to 23.00
Railroad grate bars	20.00 to 20.50
Machine shop turnings	16.00 to 16.50
Country mixed scrap	19.50 to 20.00
Uncut railroad mixed scrap	23.50 to 24.00

A new shipbuilding concern, capitalized at \$5,000,000, has been formed at Quebec, Que. The new corporation will take over the Federal Shipbuilding Co. of Sarnia, the Dominion Shipbuilding Co. of Collingwood, Dunsault & Hutchinson of Levis, and a number of old French capital interests, and build steel vessels for the French Government. Docks and yards construction has begun on the St. Lawrence River, opposite Quebec.

Buffalo

BUFFALO, July 22.

Pig Iron.—A good deal of inquiry for 1919 iron continues to come in, and a few sales for first quarter delivery are reported, subject, of course, to Government allocations and the prior filling of essential war needs. A good many consumers of all classes are anxious to get under cover to such extent as is possible and as far ahead as possible. All such forward delivery sales are made with restrictions distinctly safeguarding Government requirements and the essential industries. Producers interpret the recent announcement of the War Industries Board with reference to non-issuance of priority orders for pig iron to mean that perhaps a little more latitude will be allowed them and a somewhat freer hand in filling old orders on their books with whatever iron they may have left after caring for allocated orders and class A and B essentials. At present, Government allocations are absorbing practically all output, but furnacemen hope later in the second half to have some iron for distribution on old contracts. It cannot be figured out, however, that there will be any considerable residue to apply on class D purposes. We continue the current schedule of prices, f.o.b. furnace, Buffalo, as follows:

No. 1 foundry, 2.75 to 3.25 silicon	\$34.50
No. 2 X, 2.25 to 2.75 silicon	33.50
No. 3 foundry, 1.75 to 2.25 silicon	32.50
Gray forge	32.00
Malleable	33.50
Basic	32.00
Lake Superior charcoal, regular grades, f.o.b. Buffalo	37.50

Old Material.—Although the market is a little easier than a week ago, demand is still very active for all grades of scrap. The demand for cast scrap is particularly heavy, and largely exceeds the supply, numerous inquiries being still unsatisfied. Heavy melting steel also continues in demand at a rate that exceeds the supply. The large tonnages of shell turnings and shell ends that are currently produced by shell makers, continue to be picked up freely and one local consumer has been taking in large tonnages of these turnings. There are indications, however, that there may be some softening of demand for this material in the near future, as the immediate demands of some consumers appear to have been largely satisfied. Price schedules remain unchanged. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	\$29.00
No. 1 low phosphorus, heavy, 0.04 and under	39.00
Low phosphorus, 0.04 and under	36.50
Low phosphorus, not guaranteed	34.00
No. 1 railroad wrought	34.00
No. 1 railroad and machinery cast	34.00
Iron axles	\$44.00 to 46.00
Steel axles	44.00 to 46.00
Carwheels	29.00
Railroad malleable	34.00
Machine shop turnings	17.00 to 17.50
Heavy axle turnings	24.00
Clean cast borings	18.00 to 19.00
Iron rails	36.00 to 37.00
Locomotive grate bars	24.50 to 25.00
Stove plate	24.50 to 25.00
Wrought pipe	27.00 to 28.00
No. 1 busheling scrap	29.00 to 30.00
No. 2 busheling scrap	21.00 to 23.00
Bundled sheet stamping scrap	21.00 to 23.00

Finished Iron and Steel.—The various distributors in this territory have taken pledges as outlined as a requirement of the War Industries Board, and are in turn securing pledges from all of their customers to use steel furnished them only for the specified essential purposes. It is understood that a number of large inquiries have appeared in the market this week, some for direct war needs and some from jobbers for replenishment of stocks. A portion of the 6000 tons of reinforcing bars said to be required by the Government for warehouse purposes and for the Emergency Fleet Corporation are also before the local market, and quite a little tonnage has been taken on by local interests for Government work. Bids are being taken for reinforcing and structural steel for an addition 60 x 200 ft. for the Atlas Steel Castings Co., Buffalo, and for a considerable tonnage of structural material for a large extension of the Delaney Forge & Iron Co., Buffalo.

Philadelphia

PHILADELPHIA, July 23.

Midsummer quiet on top of Government control has given to the past week few developments. Some inquiries for future pig iron are noted but they are small even in the aggregate and few furnaces have entertained the proposals. A general belief of a shortage of scrap material persists among the scrap trade. Some sales of standard section rails have been made at \$60 to \$70 per ton, depending on the size of the lot. As showing how well the steel makers are meeting the demand for ship steel, it may be stated that for two of the fabricated shipyards 462,000 tons of steel has left the mills.

Pig Iron.—Some sales of foundry iron for first half of 1919 have been made, but usually the producer cannot see any advantage in putting such business on the books. This is partly the result of recent experiences in which allocations of iron has meant the delivery of the product to consumers not regularly customers, thus postponing the shipment of iron to regular buyers already on the books. And it is also emphasized that foundries needing iron for war orders will be able to get it under the allocation system and need not be concerned over the lack of a contract. A Middle West plate mill is in the market for 400 to 500 tons of Bessemer iron for early shipments, but it is not supposed that it is looking for a taker in the East, nor is this regarded true of a lot of 1000 to 1500 tons of low phosphorus iron desired by a Middle West steel casting company for the last half of 1918. We continue to quote standard grades of iron f.o.b. furnace, except Virginia iron, for which the delivered prices are quoted.

Eastern Pennsylvania No. 1 X.....	\$34.50
Eastern Pennsylvania No. 2 X.....	33.50
Eastern Pennsylvania No. 2 foundry.....	33.00
Virginia No. 2 X (including freight).....	37.60
Virginia No. 2 foundry (including freight).....	37.10
Basic.....	22.00
Gray forge.....	32.00
Bessemer.....	35.20
Standard low phosphorus.....	53.00
Low phosphorus (copper bearing).....	50.00

Ferroalloys.—A few inquiries have been received for ferromanganese and spiegeleisen and also for ferrochrome. The market is quiet and the prices as follows: 70 per cent ferromanganese f.o.b. furnace, with freight allowed, \$250, and 16 to 18 per cent alloy, \$75.

Coke.—We quote 48-hr. furnace coke at \$6 and 72-hr. foundry coke at \$7, Connellsville.

Billets.—We quote open-hearth rerolling billets at \$51.30 Philadelphia.

Finished Iron and Steel.—Lots of rails of 100 to 200 tons, including one of 500 tons, have been sold at \$60 to \$70 per ton, the price depending on the amount involved. In the fabricated steel field some piers for the Quartermaster Department at Philadelphia are expected to come before the trade shortly. The McClintic-Marshall Co., it is learned, has been awarded the contract for buildings for the Bethlehem Steel Co's Liberty shipyard at Alameda, Cal., this involving 12,000 tons of structural steel. It is learned that 265,000 tons of ship steel have been shipped from mills for the Hog Island yard and 197,000 tons for the Submarine Boat Co., these two items indicating to what a large extent the production of steel is ahead of the launching of ship hulls. An active demand has developed for bolts and nuts, even heavy orders for the larger sizes having been booked. To offset in a measure the fact that a number of bar iron producers do not accept business for the very small sizes, at least one producer works on an independent base price. This is 4c. per lb., Pittsburgh basis, for less than 3/8-in. rounds and for less than 1/4-in. flats; the price is asked in part to compensate labor which, working on a tonnage basis, is loath to turn out much of the low tonnage material. We quote plates, 3.48c.; plain structural material, 3.23c.; steel bars, 3.13c.; No. 10 blue annealed sheets, 4.48c.; No. 28 black sheets, 5.23c.; No. 28 galvanized sheets, 6.48c. and bar iron, 3.73c., all Philadelphia.

Old Material.—Not much business has been done, owing largely to the small supplies. One view is that a good many collectors are slow in getting the material sorted for the market, partly because the price being fixed they may well take their time against the possibility of a higher basis. It seems also to be true that a shortage of labor to do the sorting is a factor. Before long definite information will be available on the investigation of the sub-committee on scrap iron and steel of the American Iron and Steel Institute. Prices are without change, the top prices being readily obtained plus the commission. We quote for delivery at buyers' yards, eastern Pennsylvania, as follows:

No. 1 heavy melting steel.....	\$29.00
Steel rails, rerolling.....	34.00
No. 1 low phosphorus heavy 0.04 and under.....	39.00
Low phosphorus, 0.04 and under.....	36.50
Low phosphorus, 0.06 and under.....	\$32.00 to 34.00
Old iron rails.....	29.00
Old carwheels.....	29.00
No. 1 railroad wrought.....	34.00
No. 1 yard wrought.....	33.00
Country yard wrought.....	29.00
No. 1 forge fire.....	28.00 to 29.00
Bundled skeleton.....	28.00 to 29.00
No. 1 busheling.....	31.00
No. 2 busheling.....	17.00 to 18.00
Turnings (for blast furnace use).....	18.00 to 19.00
Machine shop turnings (for rolling mill use).....	18.50 to 19.00
Cast borings (for blast furnace use).....	18.00 to 19.00
Cast borings (clean).....	19.00
No. 1 cast (for steel plant use).....	29.00
No. 1 cast (cupola sizes).....	33.00 to 34.00
Grate bars.....	25.00 to 26.00
Stove plate.....	25.00 to 26.00
Railroad malleable (for steel plants).....	26.00 to 27.00
Railroad malleable (for malleable works).....	31.00 to 32.00
Wrought iron and soft steel pipes and tubes (new specifications).....	33.00
Ungraded pipe.....	29.00

British Steel Market

Advance in Pig-Iron Export Prices with Domestic Likely to Be Raised—Tin Plate Strong

(By Cable)

LONDON, ENGLAND, July 24.

An official increase of 1s. has been authorized for all deliveries for export of basic and Cleveland pig iron between Dec. 1, 1917, and March 31, 1918, and a further increase of 5s. has been authorized from April 1, 1918, all retroactive. Pig iron in general continues in active demand, but the market is unsettled owing to an expected revision of domestic prices in line with the advance for export referred to. American semi-finished steel is nominal. The tin-plate market is strong at 33s. 3d., basis, with large orders from France. The ferromanganese market is quiet. We quote as follows:

Tin plate, coke, 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, 33s. 3d.
Ferromanganese, \$250 to \$260, c.i.f. for export to America; £26 10s. for British consumption.
Ferrosilicon, 50 per cent, c.i.f., £35 upward.
On other products control prices per gross ton are:
Hematite pig iron, East Coast, £6 2s. 6d.; West Coast, £6 7s. 6d.
Cleveland pig iron (export), £5 5s. for No. 1 and £6 6s. for basic.
Steel plates, ship, bridge and tank, £11 10s. to £17, according to size.
S. M. boiler plates, basis, £12 10s.
Bar iron, standard quality, basis £13 17s. 6d.; marked, £16.
Sheet and tin plate bars, £10 7s. 6d.
Blooms and billets for rerolling (ordinary), £10 7s. 6d.; special quality, £11.
Wire rods, £21 10s. net, basis.

Price of Coal Advanced—Tin Plates Active and Strong—Pig Iron Demand Heavy

(By Mail)

LONDON, ENGLAND, July 2.—There is no relaxation of activity. No stone is left unturned to keep production at full capacity, but conditions as to fuel and labor are far from easy. The price of coal has again been raised by 2s 6d per ton, and manufacturers' costs are persistently increasing. The pressure of deliveries is

great, and the works in some directions find considerable difficulty in fulfilling their engagements.

Pig iron continues strong, current demands being greater than ever. Scotch consumers' needs are exceedingly heavy. Inquiries for the current month are already coming in on a large scale, but seem likely to be less extensive than for June, while holiday interruptions have caused some deliveries to be cancelled. The quantities diverted from the Cleveland district to Scotland in June were unusually heavy. The export movement is entirely governed by tonnage facilities, these being satisfactory as indicated by the larger June shipments. The output is well maintained and more forge iron is being made. The recent tension in regard to coke has lessened. Whether the advance in coal referred to will affect coke prices remains to be seen, although there is some talk of a possible change. Hematite production makes steady progress, but the demand is urgent.

Semi-finished steel shows no special change. Contrary to the hopes entertained recently the better home supply is in no way helping merchants. In fact more severe restrictions are threatened, which would eliminate entirely the possibility of orders being sanctioned for anything not considered absolutely essential. Wire rods are being released to manufacturers at fixed prices on condition that this material is used for national work only, and the price at which bright wire is offered to consumers is said to be £24 per ton, which compares with about £37, the figure secured prior to government intervention.

There is a brisk demand for finished iron and steel. Steel seems a little more plentiful, but it is very difficult to buy without a first class certificate. Gas strip-makers have not yet worked off the orders booked before prices were placed under control. There is a keen demand for aircraft material, including cold rolled strip and light tinne sheets, while the steel sheet mills are engaged far ahead.

Considerable quantities of steel turnings produced in the process of shell and similar manufacture find a quick outlet. There is no alteration in fixed prices, and uncontrolled material is offered sparingly, prices varying according to how makers are situated. Mild steel bars range from £18 upward, net, delivered to home consumers. Deliveries of shipbuilding material are heavy and the yards are now well provided. Bar iron makers are practically flooded with orders and new business is proceeding slowly.

Considerable business has been booked in tin plates, and more stringent conditions have obtained. With the placing of the recent big French orders, and some additional export business for Portugal and Australia, makers are now alongside of home needs exceedingly well booked at least two months ahead. They are in fact in a much stronger position than for some time past, and offers are thus restricted. The works now insist on the full maximum net basis of 32s 3d for cokes, 20 by 14, for new business. There are in any case only few makers willing to make small concessions. There is more interest in oil plates, and fair orders are waiting to be placed, makers asking full terms. Merchant business is still seriously hindered, while export licenses are difficult to secure even for Portugal. Export deliveries have been hindered in recent weeks through lack of shiproom, but clearances have now improved.

Ferromanganese is more firmly held for American North Atlantic ports, and some further business has been done lately both for the States and Canada. Current quotations for 80 per cent now range from \$260 to \$270 c.i.f. subject to license. Small orders continue to be booked for Continental ports, the terms quoted varying from £55 to £60 f.o.b. for loose.

Negotiations are under way between the Laclede Gas Light Co., St. Louis, and the Government for the extension of the coke oven plants of the company. It is understood that there is contemplated a loan from the Government to enable the gas company to increase its output of toluol and other gas by-products.

Cincinnati

CINCINNATI, July 23—(By Wire).

Pig Iron.—An investigation of the situation as affecting the stove makers reveals the fact that a few of them in this territory have sufficient iron to carry them through the year. However, their inability to purchase metal for the first half of next year disrupts their selling plans to a considerable extent. Several stove manufacturing firms have Government orders and a number have recently taken contracts for war material outside of their regular lines. Differences of opinion between the furnaces and melters have arisen as to what should be considered essential work. So far, the furnaces have taken the safe side and in some instances have refused to ship iron to melters whose questionnaires showed that they were doing only a small percentage of essential work. Considerable iron is going forward that is overdue on contracts taken before the \$33 price was fixed. This naturally increases the average invoice prices on the books of different selling agencies. Although some of this iron was sold close to \$40 per ton, consumers have shown no desire whatever to cancel and this is considered good evidence that they appreciate fully present conditions.

Based on freight rates of \$3.60 from Birmingham and \$1.50 from Ironton, we quote f.o.b. Cincinnati:
Southern coke, No. 2 foundry and No. 2 soft.. \$36.60
Southern Ohio, No. 2..... 34.50
Basic, Northern 33.50

Coke.—Some sales of foundry coke for next year's shipment have been made both by Connellsville and Wise county operators. These contracts are based on present quotations and subject to change to conform with the Government's maximum price at time of delivery. The tonnage is somewhat limited and consumers of coke are beginning to rely more than ever before on the Fuel Administration to see that they are supplied with sufficient fuel to enable them to get out essential work in hand. The stove makers will probably have hard sledding to get either coke or pig iron, unless actually engaged in strictly essential work. Some shifting around of shipments on contracts has been made and considerable coke has been diverted from concerns not engaged in essential work to other consumers who have more urgent contracts. This action has not been entirely confined to foundry coke, and some pig iron furnace operators in southern Ohio have lately had a little difficulty in the recommended allocation of fuel. This has now been smoothed out and it is believed that only a reduction in the coke output will cause any future trouble.

Old Material.—There is no divergence of opinion as to the demand for scrap of all kinds being short of the supply. Quotations are gradually being advanced and the maximum prices agreed on may be enforced at an early date. The freight rate matter has somewhat dislocated business, but this problem has now practically been solved and everything is now running more smoothly. No. 1 machine cast is in much better demand, as many foundries not engaged in strictly essential work are increasing scrap in their mixtures to an extent not heretofore known. The following are dealers' prices, f.o.b. at yards in carload lots, southern Ohio and Cincinnati:

Per Gross Ton	
Bundled sheet scrap.....	\$21.00 to \$21.50
Old iron rails.....	33.50 to 34.00
Relaying rails, 50 lb. and up.....	44.50 to 45.00
Re-rolling steel rails.....	32.00 to 32.50
Heavy melting steel scrap.....	27.50 to 28.00
Steel rails for melting.....	27.50 to 28.00
Old carwheels.....	28.50 to 29.00

Per Net Ton	
No. 1 railroad wrought.....	\$29.00 to \$29.50
Cast borings.....	14.00 to 14.50
Steel turnings.....	14.50 to 15.00
Railroad cast.....	25.00 to 25.50
No. 1 machinery.....	27.50 to 28.00
Burnt scrap.....	17.50 to 18.00
Iron axles.....	40.00 to 40.50
Locomotive tires (smooth inside).....	35.50 to 36.00
Pipes and flues.....	21.00 to 21.50
Malleable cast.....	24.50 to 25.00
Railroad tank and sheet.....	18.50 to 19.00

Finished Material.—Some disappointment is voiced

by the jobbers as to the slow shipments from the mills. It was thought for a while that the ready response of the jobbing houses in filling urgent orders for strictly war industrial concerns would aid them in replenishing their stocks. All of the local houses have gone out of their way to supply firms on war work, as well as different departments of the Government, with anything that they had in stock. Strict supervision is exercised over the distribution of material and even all small orders are scrutinized very closely and are not filled until reasonable proof is presented that the buyer is engaged in essential work. The barbed wire situation has not been relieved and there is practically not a reel of it in stock. Wire nails are also very scarce, although urgent orders are being taken care of by reducing shipments in some cases. High-speed steel can be shipped more promptly by a number of different firms. The Pollak Steel Co. has been allocated 2500 tons of steel axles that will be furnished by the Republic Iron & Steel Co.

The following are local jobbers' prices: Steel bars and small structural shapes, 4.13c. base; large rounds and squares 2 in. and over, 4.23c. base; plates, 4.48c. base; No. 10 blue annealed sheets, 5.48c.; steel bands, 3/16 in. and lighter, 4.98c. base (using the new band list). Reinforcing concrete bars, 4.23c., and wire nails, \$4.25 per keg base.

New York

NEW YORK, July 24.

Pig Iron.—New York representatives of Northern furnaces, as a rule, are declining to make sales for delivery next year, the prevailing opinion being that owing to the great uncertainty as to conditions which may prevail after Jan. 1, nothing will be gained and much may be lost by selling so far in advance. There is, however, a large volume of inquiry for the distant delivery and some Southern sellers are showing a disposition to book a moderate tonnage. One Alabama company has taken orders amounting to 10,000 tons for delivery in the first half of 1919 and has declined an equal tonnage. The general opinion is that there will not be a pig iron shortage and at the present time shipments are moving forward satisfactorily, so that few complaints from melters are heard. The Keystone furnace of the Northern Ore Co. at Island Park, Pa., formerly owned by the Thomas Iron Co., will be blown in this week after a long period of idleness during which the stack was rebuilt. It will be run on Bessemer. We quote prices as follows for tide-water delivery on the basis of the new freight rates on Northern and Southern grades:

No. 1 X.....	\$35.40
No. 2 X.....	34.00
No. 2 plain.....	33.90
No. 2 X Virginia.....	37.90
No. 1 Southern (all rail).....	42.20
No. 2 Southern (all rail).....	40.70

Ferroalloys.—Present demand continues very light for domestic ferromanganese, most consumers having provided for their immediate future. It is believed, however, that further buying will soon materialize for delivery in the last half as it is understood users are not fully covered to Jan. 1, 1919. There have been a few sales of small lots at \$250, delivered, for 70 per cent alloy, plus \$4 per unit above this standard, which continues the firm quotation. The representative of a British producer cited last week as having 650 tons of 80 per cent alloy available for shipment to this country on contract if permission could be secured to import it, now has 400 tons more available under the same conditions. The same seller can also import 1000 tons of British spiegeleisen, 18 to 22 per cent, if arrangements can be secured to ship it. The spiegeleisen market is quiet but strong at \$75, furnace, for 16 per cent alloy plus \$3.50 per additional unit with only sales of small lots reported. Ferrosilicon, 50 per cent, is unchanged at \$150 per ton on contract and up to about \$160 for prompt delivery.

Finished Iron and Steel.—New railroad bridge work includes 1000 tons for the Pennsylvania, 350 tons for the New York Central, 150 tons for the Philadelphia & Reading and 100 tons for the Boston & Albany at West-

field, Mass. The Boston Bridge Co. will supply 1900 tons of material for 39 bridges for the Boston & Maine; the Phoenix Bridge Co., 170 tons for the Reading, and the American Bridge Co. 160 tons for a highway bridge for the New York Central. For the Government, 700 tons additional work will be required for the nitrate plant near Sheffield, Ala., and the new picric acid plant at Brunswick, Ga., has been enlarged and will involve 1500 tons. It now appears that the Snare & Triest Co. was low bidder for the aircraft storage building, Brooklyn, and Post & McCord are low on 250 tons at the Brooklyn Navy Yard. The McClintic-Marshall Co. will supply 375 tons for magazines and storehouses at Hingham, Mass. Some question has arisen over the orders to Chicago district mills to push out contract plates for Japan, doubt being raised as to how equitable the allocation has been; but at any rate, considerable pressure has been brought to bear to expedite the delivery of plates to Japan under the agreement now of some weeks' standing. We quote mill shipments as follows: Steel bars, 3.145c.; shapes, 3.245c.; plates, 3.495c., and bar iron, 3.745c., all New York. Out-of-store prices are 1c. higher.

Cast Iron Pipe.—Cast-iron pipe shops report that they are finding it rather difficult to obtain satisfactory delivery of pig iron. It seems to be a hard to mouth proposition, but none has been required to close. The Government is urging deliveries on pipe intended for its own use and in turn the pipe men are reminding Government officials that pig iron must be forwarded in order to keep the plants in operation. Government prices, including the new freight rates, are as follows: \$61.75, New York, for 6-in. and heavier; and \$64.75 for 4-in.; \$71.75 for 3-in., with \$1 additional for class A and gas pipe.

Old Material.—The new regulations in regard to scrap are being favorably received and the specifications in regard to cast scrap are considered as protecting the foundries because they check the tendency of the steel plants to buy material which ordinarily goes to foundries. The wording of the cast scrap schedule was changed in order to make it more explicit so that there would be no misunderstanding, as it had been found that some sellers were trying to force the buyers to pay \$34 per gross ton, delivered, for off-grade scrap. This was not the intention of the original schedule. We quote prices of brokers to New York producers and dealers, per gross ton, New York, as follows:

Heavy melting steel.....	\$26.20
Re-rolling rails.....	30.80
Relaying rails.....	\$60.00 to 70.00
Iron and steel car axles.....	43.70
No. 1 railroad wrought.....	30.80
No. 1 railroad wrought, cut to not less than 10 in. or over 24 in.....	35.80
Wrought-iron track scrap.....	28.80
Forge fire.....	23.50 to 24.00
No. 1 yard wrought long.....	28.80
Light iron.....	10.00 to 11.00
Cast borings (clean).....	15.30 to 15.80
Machine-shop turnings.....	15.30 to 15.80
Mixed borings and turnings.....	15.05 to 15.35
Iron and steel pipe (1 in. minimum diameter), not under 2 ft. long.....	29.30 to 30.80
Stove plate.....	23.50 to 24.00
Locomotive grate bars.....	23.50 to 24.00
Malleable cast (railroad).....	30.30 to 30.80
Old carwheels.....	25.80

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, are:

No. 1 machinery cast.....	\$34.00
No. 1 heavy cast (columns, building materials, etc.), cupola size.....	34.00
No. 1 heavy cast, not cupola size.....	29.00
No. 1 cast (radiators, cast boilers, etc.).....	\$27.00 to 28.00

Members of the Electric Hoist Manufacturers' Association, numbering nine companies, with two or more representatives from each company, were the guests of the Shepard Electric Crane & Hoist Co. at Montour Falls, N. Y., at the association's June meeting. The session lasted two days and business and pleasure were intermingled. The hoist manufacturers were shown through the Shepard plant, and later were taken to luncheon and dinner and an automobile ride through the surrounding country.

Cleveland

CLEVELAND, July 23.

Iron Ore.—It is expected that the Federal Trade Commission will check up the operating costs of the Lake Superior mines as presented by the independent mine operators at the recent hearing in Washington when the 45c. per ton advance in ore prices was made. These figures of cost will probably be used by ore men as a basis for asking for a further advance in prices next year. Reports indicate that none of the underground mines have been shut down, the advance in price permitting them to about break even. The ore movement is continuing at a very heavy rate. We quote f.o.b. lower Lake ports as follows:

Old range Bessemer, \$6.40; old range non-Bessemer, \$5.65; Mesaba Bessemer, \$6.15; Mesaba non-Bessemer, \$5.50.

Coke.—The Government has never issued an order that was expected to be sent out prohibiting the shipment of Connellsville foundry coke to the Cleveland territory and some of the coke men predict that an order to that effect will never be made. Recently one Connellsville producer covered its trade in the Cleveland territory with first half contracts for foundry coke and two other producers have now opened their books for foundry coke orders from their regular trade for the same delivery. The supply of by-product coke from Cleveland plants is still plentiful, and most consumers are apparently covered for their last half requirements.

Pig Iron.—The buying movement in pig iron for delivery during the first half of 1919 is growing. Sellers report an increase in the volume of inquiry and most producers in the Cleveland territory have opened their books for next year. Sales of foundry and malleable grades for that delivery were fairly heavy during the week and one round lot of basic iron was sold. It is the policy of sellers to take orders only from consumers engaged in war essential work. One Cleveland selling agency has announced that it plans to keep its books open until it sells its entire output of foundry and malleable grades. Another Cleveland interest which has made some sales has decided to take on no more orders unless the buyers in each case secure the approval of Director Replogle. The demands upon the Government for iron, which are being turned over to the Committee on Pig Iron, Iron Ore and Lake Transportation for allocation, are steadily growing heavier and the committee is finding it more difficult every day to secure the iron needed. Allocations since May 1 aggregate 378,000 tons and the committee now has before it 200,000 tons to be allocated, inquiry for much of this having come out during the week. During the past week, allocations amounted to 130,000 tons. These include 95,000 tons of the 180,000 tons of basic iron wanted for England. Of this 65,000 tons has been allocated to a Cleveland interest and 30,000 tons to an Alabama furnace. The committee plans to allocate the remaining 85,000 tons shortly among Northern producers. It was the original intention to distribute 80,000 tons of this iron in the South, but it is stated that this plan has not been adopted because machine cast basic is wanted and only one Southern producer is equipped to supply machine cast iron. The allocations the past week were 98,000 tons of basic iron, 27,000 tons of foundry, 4700 tons of malleable, and 400 tons of silvery iron. Among important allocations were 3000 tons of basic iron to a Central Pennsylvania consumer, 4000 tons of Bessemer for Canada, 1000 tons of foundry for Attica, N. Y., 1000 tons of foundry for Philadelphia, 1000 tons of foundry for Waterbury, Conn., 1400 tons of foundry for Albany, N. Y., 1000 tons of malleable and 1100 tons of foundry for an Indianapolis consumer, 1000 tons of foundry for Beaver Falls, Pa., 2000 tons of foundry for South Bend, Ind., 700 tons of foundry for Fitchburg, Mass., 600 tons of foundry for Holyoke, Mass., and 2000 tons of foundry for Washington and Oregon consumers. New inquiries that are pending include 13,000 tons of basic for an Iowa plant and 5000 tons of malleable iron for an Illinois plant, both wanted for railroad work, and 12,000 tons of basic iron for the Pittsburgh district.

One Eastern Pennsylvania furnace now making foundry iron is going on low phosphorus iron and the committee will take care of this plant's foundry iron orders amounting to 17,000 tons. One Southern furnace had 1000 tons of high silicon iron available for delivery to Sept. 1 and this was quickly disposed of during the week. Considerable inquiry is pending for Southern iron for the first half of next year, but furnaces have not opened their books for that delivery. We quote delivered Cleveland, as follows:

Bessemer	\$36.00
Basic	33.40
Northern No. 2 foundry.....	33.40
Southern No. 2 foundry.....	38.00
Gray forge	32.40
Ohio silvery, 8 per cent silicon.....	47.90
Standard low phosphorus, Valley furnace.....	53.00

Bolts, Nuts and Rivets.—The demand for bolts and nuts is heavy. Manufacturers are covering the implement trade and other consumers with contracts for the last half with Pittsburgh instead of the shipping point as the base, as recently agreed upon by the manufacturers. These contracts are subject to any price revision the Government may make for the last quarter. Jobbers are also buying quite freely now that the Government has permitted this trade to be supplied. Rivet specifications are coming out in large volume for the Government car orders as well as from the shipyards.

Old Material.—There is a fairly good demand for most grades of scrap, and dealers say that it is easier to sell than to buy, as material is not plentiful. An Erie consumer has purchased a round lot of low phosphorus steel scrap, 2000 tons of which was placed with a Cleveland dealer. Borings and turnings are more active than they have been, but borings are scarce. The demand for cast scrap is not active. It is said that many foundries would be glad to use a larger proportion of scrap in their mixture than at present, but are unable to do so because most of the pig iron that is being supplied is low in silicon. Prices are somewhat firmer on cast scrap, borings, turnings and stove plate. We quote delivered consumers' yards in Cleveland and vicinity as follows:

Per Gross Ton	
Steel rails	\$27.00 to \$28.00
Steel rails, rerolling	34.00
Steel rails, under 3 ft.	34.50
Iron rails	39.00
Iron car axles	46.50
Steel car axles.....	46.50
Heavy melting steel	29.00
Cast borings.....	18.50 to 18.75
Iron and steel turnings and drillings. 18.00 to	18.25
No. 1 railroad wrought.....	34.00
Hydraulic compressed sheet scrap....	28.00 to 29.00
Cast-iron car wheels, unbroken	29.00
Cast-iron car wheels, broken.....	34.00
Agricultural malleable	24.00 to 25.00
Railroad malleable	34.00
Steel axle turnings	24.00
Light bundled sheet scrap.....	24.50 to 25.00
Cast-iron scrap	29.00
Cast-iron scrap, broken to cupola size 32.00 to	33.00
No. 1 busheling	29.00 to 30.00
Per Net Ton	
Railroad grate bars	\$22.00 to \$22.50
Stove plate	22.50 to 23.00

Finished Iron and Steel.—Manufacturers in the less essential lines are finding it increasingly difficult to get material. This statement covers the situation in a general way in respect to this territory. Some mills have more tonnage on their books of a higher priorities rating than ever and are declining all orders for their principal products, even those having a class A rating. Some are taking orders for certain sections and declining orders for other sections having the same rating, depending on the tonnage on their books for their different mills. A few mills are able to make fair deliveries on class B material in some sizes of steel bars. Among essential industries the tightness is seriously affecting the implement and tractor manufacturers. Automobile manufacturers are still eagerly picking up various odds and ends that can be rerolled to meet their requirements. An illustration of the urgent need of material among some manufacturers is shown in the travels of 80 tons of forging steel. This material was shipped from the Pittsburgh district to New

England, but being found unsuitable for the needs of the purchaser, was resold to a Central Western automobile manufacturer. The latter also found that he could not use the steel and it was again resold to another New England manufacturer, who, in addition to paying the regular Government price and extras, assumed the freight charges for shipment from New England to the Central West and back. Some mills are now checking up the stocks of their larger consumers in order to prevent hoarding. Demand for Government work continues active. Among inquiries is one for 1000 tons of bands and small angles for rolling kitchens and 1250 tons of tire steel for artillery wagons. There is a heavy demand for flanged heads for Government work. A round tonnage of the hull steel for the American Shipbuilding Co. has been re-allocated. The Cleveland Railway Co. is inquiring for 500 tons of standard rails. The demand for hard steel bars is active, but bar iron mills report a scarcity of orders. Warehouse prices are as follows:

Steel bars, 4.07c.; plates, 4.42c.; structural material, 4.17c.; No. 10 blue annealed sheets, 5.42c.; No. 28 black sheets, 6.42c.; No. 28 galvanized sheets, 7.67c.

IRON AND INDUSTRIAL STOCKS

No Substantial Buying Movement Results from Favorable War Developments

NEW YORK, July 24.

The favorable war developments beginning with the Franco-American counter-offensive on the Marne last Thursday were reflected on the stock market by a stimulation of optimism which carried prices upward rather rapidly on the first day. No marked increase in orders was reported by brokers, however, and the public showed little disposition to buy at higher levels. Apparently current buying reflects the view that the war will dominate all activities for some time to come. The increase in quotations on iron and steel stocks was but a few points at most.

The range of prices on active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis-Chalmers co. 32 1/4 - 37 1/4	Lackawanna Stl. 82 1/4 - 84 1/4
Allis-Chalmers pf. 82 1/4 - 82 1/4	Lake Su. Corp. 19 1/4 - 21 1/4
Am. Can. com. 46 1/4 - 48 1/4	Lima Loco. 45 - 46 1/4
Am. Can. pf. 94 1/4 - 94 1/4	Midvale Steel. 50 1/4 - 52 1/4
Am. Car & F. co. 82 1/4 - 85 1/4	Nat-Acme 30 - 30 1/4
Am. Car & F. pf. 109 1/4 - 110	Nat. Enam. & St. com. 51 - 52
Am. Loco. com. 65 1/4 - 68 1/4	N. Y. Air Brake. 124
Am. Ship. com. 125 - 128	Nova Sco. Steel. 59 - 60
Am. Steel Fdries. 71 - 75	Pr. Steel. com. 65 - 68 1/4
Bald. Loco. com. 87 1/4 - 92 1/4	Ry. St. Spr. com. 59 1/4 - 62 1/4
Beth. Steel com. 85	Ry. St. Sp. pf. 98 1/4 - 99 1/4
Beth. Stl. cl. B 80 1/4 - 84 1/4	Republic. com. 90 - 94
Case (J. I.) pf. 82	Republic. pf. 100 - 100 1/4
Cent. Fdy. com. 34 1/4	Sloss, com. 62 - 63 1/4
Cent. Fdy. pf. 44 - 45 1/4	Sloss, pf. 93
Chl. Pneu. Tool. 68 - 70	Superior Steel. 42 - 43 1/4
Colo. Fuel. 44 1/4 - 48 1/4	Un. Alloy Steel. 28 1/4 - 40
Cru. Steel. com. 64 1/4 - 68 1/4	U. S. Pipe. com. 14 1/4
Cru. Steel. pf. 90 1/4 - 91 1/4	U. S. Steel. com. 104 1/4 - 109
Gen. Electric. 144 - 147 1/4	U. S. Steel. pf. 111 - 111 1/4
Gt. No. Ore Cert. 31 1/4 - 33 1/4	Va. I. C. & Coke 71 1/4 - 71 1/4
Gulf States Steel. 84 1/4	Warwick 8 - 8 1/4
Int. Har. of N. J. com. 124 1/4 - 124 1/4	Westhouse Elec. 41 1/4 - 43 1/4
Int. Har. Cor. co. 64 1/4 - 65 1/4	

Dividends

The Cleveland-Cliffs Iron Co., quarterly, 2 1/2 per cent, payable July 25.

The National Carbon Co., Inc., quarterly, \$1 on the common and \$2 on the preferred, payable Aug. 1.

The National Enameling & Stamping Co., quarterly, 1 1/2 per cent on the common, payable Aug. 30.

The Steel Products Co., 3 per cent on the common, payable July 26.

The Taylor-Wharton Iron & Steel Co., quarterly, 1% per cent on the preferred, payable Aug. 1.

The Wheeling Mold & Foundry Co., quarterly, \$2 on the common, payable Aug. 1.

Liquidating the Thompson Estate

UNIONTOWN, PA., July 22.—Initial payment made by C. G. Rockwell, an attorney of Chicago, representing a syndicate of Chicago capitalists, to the trustees in bankruptcy of Josiah V. Thompson, former coal operator, marks the last step which can be taken

outside the courts in consummating the second largest deal in liquidating the vast estate. The payment was made when options taken upon 5000 acres of virgin coal lands in Franklin and Whitely townships, Greene County were exercised. The selling price will average \$350 per acre which is considered equitable because of the location of the property removed from present railroad facilities. The present deal will approximate \$2,000,000. No intimation has been given as yet of the identity of the purchasers but that information will likely be forthcoming during the proceedings before Referee in Bankruptcy J. G. Carroll before whom the sale will be submitted at once for confirmation.

Carbon Steel Co. Quarterly Report

The Carbon Steel Co., Pittsburgh, issued its quarterly report for the three months ended June 30, 1918, the statement of earnings for the quarter being as follows:—

Balance surplus April 1, 1918.....	\$2,946,018.93
Net profits for quarter ending June 30, 1918, after deducting reserves for Federal income and war excess profits taxes.....	\$505,433.04
Less sundry adjustments.....	1,054.65
	504,378.39
Total surplus June 30, 1918.....	\$3,450,397.32
Deduct:	
Cash dividends as follows:	
12% on common stock,	
Payable July 15, 1918.....	\$360,000.00
Reserve for extraordinary replacements and improvements.....	100,000.00
Subscriptions to American Red Cross and other war funds....	16,750.00
	476,750.00
Balance surplus June 30, 1918.....	\$2,973,647.32

Checks were sent to stockholders for the dividend on the common stock, payable July 15, and checks for the annual dividend of 6 per cent on the second preferred stock will be mailed to stockholders on July 30. Charles McKnight, president of the company, in his remarks to stockholders says:—

"The company is lending every possible assistance to the Government in its war work, and it is gratifying to report that the contracts placed with the company are being successfully and expeditiously carried out."

Canadian Car Troubles Settled

The internal troubles of the Canadian Car & Foundry Co. have been satisfactorily adjusted and a board of directors satisfactory to the contending factions has been elected as follows: W. F. Angus, C. P. Beaubien, H. W. Beauclerk, K. W. Blackwell, W. W. Butler, N. Curry, V. M. Drury, G. G. Foster, H. J. Fuller, Erskine Hewitt, A. H. Lawrence, William McMaster, F. A. Skelton, E. C. Smith and M. Workman.

President Curry has issued a statement saying that the settlement was dictated largely by patriotic motives, as it was recognized that neither governments, corporations, nor individuals care to do business with a company afflicted with internal strife and litigation. He said that for insurance and other purposes, full appraisals have recently been made of all the plants, showing that the company had a value of \$165 behind every preferred share and \$100 behind every common share.

Industrial Finances

In the court at Pittsburgh last week an order was made foreclosing a mortgage on the property of the Safety Armored Conduit Co., given to secure a bond issue of \$480,000, and directing that the property be sold at public sale at a time to be fixed later. The decree was requested in a bill in equity filed by the Fidelity Title & Trust Co., trustee under the mortgage, in which it was stated that no payments on the principal of the bond issue have been made and that no interest had been paid since Jan. 1, 1916. The total amount of principal and interest unpaid, it is stated, is \$556,320. The trustee states that the terms of the mortgage have not been complied with, and the court is asked to order the foreclosure. The plant of the company is located at West Pittsburgh, Pa.

Metal Markets

The Week's Prices

		Cents Per Pound for Early Delivery					
Copper, New York		Tin,	Lead		Spelter		
		Electro-	New	New	St.	New	St.
July	Lake	lytic	York	York	Louis	York	Louis
17.....	26.00	26.00	*94.00	8.05	7.75	8.75	8.50
18.....	26.00	26.00	*94.00	8.05	7.75	8.75	8.50
19.....	26.00	26.00	*94.00	8.05	7.75	8.75	8.50
20.....	26.00	26.00	8.05	7.75	8.62½	8.37½
22.....	26.00	26.00	*94.00	8.05	7.75	8.62½	8.37½
23.....	26.00	26.00	*94.00	8.05	7.75	8.62½	8.37½

*Nominal.

NEW YORK, July 24.

The markets are generally quiet but strong. The copper situation is firm both as to price and demand. Tin is very quiet. Lead is scarcer than a week ago and practically unobtainable for early delivery. Antimony is slightly stronger.

New York

Copper.—Interest centers from now on in the meeting in Washington on Aug. 7 when the price of copper, which is to obtain after August 15, will be fixed. An advance of 1½c. per lb. to 27½c. is talked about and there is even the rumor, at least, that 30c. copper will be experienced before the end of the year. It is claimed the advance of 2½c. per lb. on July 2 does not meet the full increase in production costs because freight rates in the East than was estimated at first. As a result of the recent experience in the sudden change of price effective on July 2, after an announcement of no change until Aug. 15 and the resulting confusion, sales are only being made on the basis of the fixed price at the time of delivery. Copper exports in June were 31,791 gross tons, exclusive of those to Canada. This is 10,000 tons less than in June, 1917. The total for the first half of 1918 has been about 186,370 tons against 274,763 tons in the first half of 1917 or a decrease this year of almost 32 per cent.

Tin.—The market has experienced a very interesting and important event in the last week, one that may be of far reaching importance. What amounts in a measure to almost a ban on shipments of tin from the Straits is contained in an official announcement that no metal can be shipped from Singapore or Penang except by the consent or license of the government of the Federated Malay States. This means that all Straits or English tin is virtually fixed as to price in London and New York in that none can be sold except at a price based on Singapore or Penang, plus expenses of shipment and insurance and a reasonable profit. Ultimately the effect of such a rule will be to affect the price of Banca and Chinese tin. That this new ruling, which is virtually a British measure, is very important is clear from the fact that there are practically no offerings from London, sellers being inclined to feel their way until the matter is more fully understood. The market in general is very quiet with practically no business done except in Chinese and Banca tin afloat. There are no offerings for future shipment. Spot tin is still nominal at 94c. New York. Arrivals at Atlantic ports to July 17 inclusive have been 600 tons with those at Pacific ports to July 20 at 4280 tons. The London market is still advancing, spot Straits tin being quoted yesterday at £365 10s per ton, or £10 higher than a week ago.

Lead.—It is almost impossible to secure lead for any reasonably early delivery. The market is virtually cleaned out with most producers all sold up and some over-sold. The quotation is held at 8.05c. New York or 7.75c. St. Louis. Some consumers are hard pressed for supplies and efforts to obtain small amounts have resulted in their paying 8.20c., New York, for spot delivery. Some dealers are understood to have sold one or two carloads for spot delivery at 8.75c. New York.

Spelter.—The slightly easier tone in evidence last week continues, but there is very little inquiry and very few transactions reported. Quotations are largely nominal and depend on the viewpoint of the seller, some declining to quote or at least differing as to their ideas of values. Sales of prime Western in small lots have been made at 8.35c. to 8.40c. St. Louis for early delivery and others have gone at 8.50 to 8.55c. St. Louis. The market is generally quoted at 8.37½c. St. Louis or 8.62½c., New York, for early delivery. The report of the *Engineering and Mining Journal* on the spelter output and stocks for the second quarter is of a bullish nature, but the market has not reflected this. This authority places the output for the second quarter at 127,000 tons, which is 9000 tons less than the first quarter and 60,000 tons less than that of the second quarter of 1917. On July 1, only 57 per cent of the retorts were in operation and stocks of spelter July 1 were 18,400 tons less than they were on April 1.

Antimony.—The market is a little stronger at 13.25c. New York, duty paid, with a fair demand reported.

Aluminum.—Maximum Government prices control sales of No. 1 virgin metal, 98 to 99 per cent pure, and scrap metal at 33c. per lb. for 50-ton lots, at 33.10c. per lb. for 15 to 50-ton lots and at 33.20c. per lb. for 1 to 15-ton lots.

Old Metals.—The market is very quiet. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible.....	26.00
Copper, heavy and wire.....	25.00
Copper, light and bottoms.....	23.00
Brass, heavy.....	17.75
Brass, light.....	13.00
Heavy machine composition.....	26.50
No. 1 yellow rod brass turnings.....	14.50
No. 1 red brass or composition turnings.....	23.50
Lead, heavy.....	7.625
Lead, tea.....	6.25
Zinc.....	6.50

Chicago

JULY 23.—Continued heavy demand is the feature in copper, the market for which is tightening. Manufacturers in the non-preferred classes find it difficult to obtain the metal. While there is no scramble for tin, it is not easy to get. So far, there has been enough to go around, but the outlook is not reassuring. Lead is practically unobtainable for any delivery and there is a suspicion that it is being withheld from the market. Spelter is weaker and is offered more freely than when the price was higher. Only a routine quiet demand exists for antimony. We quote copper at 26c. for carloads and 27.30c. for less than carloads; tin, \$1 to \$1.05; lead, 7.87½c. to 8.12½c.; spelter, 8.50c. to 8.62½c.; antimony, 14c. to 15c. On old metals we quote buying prices, less than carload lots, as follows: Copper wire, crucible shapes, 22c.; copper clips, 21.50c.; copper bottoms, 20c.; red brass, 21c.; yellow brass, 14c.; lead pipe, 6c.; zinc, 5.50c.; pewter, No. 1, 55c.; tinfoil, 65c.; block tin, 70c.

St. Louis

July 22.—Non-ferrous metals have continued firm in this market, with the close to-day on less than carload lots as follows: Lead, 8.25c.; spelter, 9.50c.; tin, \$1.10; copper, 27.65c.; Asiatic antimony, 15c. Car lot quotations were: Lead, 7.75c.; spelter, 8.62½c. In the Joplin district the market was generally stronger in tendency, but second grade ores, basis of 60 per cent metal for zinc blende, did not get above \$55 per ton, although the usual quantity of high grade ore was sold at \$75 per ton for the zinc sheet makers' use. Some medium grade ores were sold at \$60 per ton, and the average for the week for the district was \$57.50 per ton. Calamine was steady on a wide range, the quotation for ore on the 40 per cent metal basis being \$25 to \$37.50 per ton. The average for the week was \$34 per ton. Lead was strong at \$97.50 per ton, but the buyers refused to go to the \$100 mark which the producers wanted for ore on the basis of 80 per cent metal. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 10c.; heavy yellow brass, 14c.; heavy red brass, 19.50c.; light copper, 18.50c.; heavy copper and copper wire, 20c.; pewter, 30c.; tin-foil, 60c.; zinc, 5c.; lead, 6c.; tea lead, 5c.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

An advance in freight rates of 25 per cent from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, went into effect June 25, 1918. The rates from Pittsburgh, in carloads, to points named, per 100 lb. are as follows: New York, 24.5c.; Philadelphia, 23c.; Boston, 27c.; Buffalo, 17c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; Denver, 99c.; Omaha, 59c.; minimum carload, 36,000 lb. to four last named points; New Orleans, 38.5c.; Birmingham, 57.5c.; Pacific Coast, \$1.25; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is \$1.315, minimum carload 40,000 lb.; and \$1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c., minimum carload 46,000 lb.; Denver, 99c., minimum carload 46,000 lb. A 3 per cent transportation tax applies. On iron and steel items not noted above, rates vary somewhat and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, structural sizes, 3c.

Wire Products

Wire nails, \$3.50 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails taking an advance over this price of \$2, and shorter than 1 in., \$2.50. Bright basic wire, \$3.35 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$3.25; galvanized wire, \$3.95; galvanized barb wire and fence staples, \$4.35; painted barb wire, \$3.65; polished fence staples, \$3.65; cement-coated nails, \$3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 47 per cent off list for carload lots, 46 per cent for 1000-rod lots, and 45 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....\$4.40 base
Large boiler rivets.....\$4.50
1 16 in. x 6 in. smaller and shorter rivets... 50-10 per cent off list
Machine bolts h.p. nuts, ½ in. x 4 in.:
Smaller and shorter, rolled threads..... 50-10-5 per cent off list
Cut threads..... 50-5 per cent off list
Larger and longer sizes..... 40-10 per cent off list
Machine bolts c.p.c. and t. nuts, ½ in. x 4 in.:
Smaller and shorter..... 40-10 per cent off list
Larger and longer..... 35-5 per cent off list
Carriage bolts, ½ x 6 in.:
Smaller and shorter, rolled threads..... 50-5 per cent off list
Cut threads..... 40-10-5 per cent off list
Larger and longer sizes..... 40 per cent off list
Lag bolts..... 50-10 per cent off list
Flow bolts, Nos. 1, 2, 3..... 50 per cent off list
Hot pressed nuts, sq. blank..... 2.50c. per lb. off list
Hot pressed nuts, hex. blank..... 2.30c. per lb. off list
Hot pressed nuts, sq. tapped..... 2.30c. per lb. off list
Hot pressed nuts, hex. tapped..... 2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank..... 2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped..... 2.00c. per lb. off list
Semi-finished hex. nuts:
¾ in. and larger..... 60-10-10 per cent off list
9/16 in. and smaller..... 70-5 per cent off list
Sieve bolts..... 70-10 per cent off list
Sieve bolts..... 2½ per cent extra for bulk
Tire bolts..... 50-10-5 per cent off list

The above discounts are from present lists now in effect.
All prices carry standard extras.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, \$57; chain rods, \$65; screw, rivet and bolt rods and other rods of that character, \$65. Prices on high carbon rods are irregular. They range from \$70 to \$80, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, 9/16 in. x 4½ in. and heavier, per 100 lb., \$3.90, in lots of 200 kegs of 200 lb. each, or more; track bolts, \$4.90. Boat spikes, \$5.25 per 100 lb., f.o.b. Pittsburgh.

Terne Plate

Effective May 21 prices on all sizes of terne plates are as follows: 8-lb. coating, 200 lb., \$15 per package; 8-lb. coating, 1 C., \$15.30; 12-lb. coating, 1 C., \$17.00; 15-lb. coating, 1 C., \$18.00; 20-lb. coating, 1 C., \$19.60; 25-lb. coating, 1 C., \$20.60; 30-lb. coating, 1 C., \$21.75; 35-lb. coating, 1 C., \$22.75; 40-lb. coating, 1 C., \$24.00 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.90c. from mill, and 4.50c. to 5c. from warehouse in small lots for prompt shipment. Refined iron bars, 3.50c. in carload and larger lots, f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, as announced Nov. 5 by the Government on steel pipe, those on iron pipe being the same as quoted for some time:

Steel			Butt Weld			Iron		
Inches	Black	Galv.	Inches	Black	Galv.	Inches	Black	Galv.
1/4, 1/2 and 3/4	44	17 1/2	1/4 and 1/2	23	+4	1/4 and 1/2	23	+4
1/2	48	33 1/2	1/2	24	+3	1/2	24	+3
3/4 to 3	51	37 1/2	3/4 to 1 1/2	28	10	3/4 to 1 1/2	28	10
Lap Weld			Lap Weld			Lap Weld		
2	44	31 1/2	1 1/4	18	3	1 1/4	18	3
2 1/2 to 6	47	34 1/2	1 1/2	25	11	1 1/2	25	11
7 to 12	44	30 1/2	2	26	12	2	26	12
13 and 14	34 1/2	..	2 1/2 to 6	33	15	2 1/2 to 6	33	15
15	32	..	7 to 12	35	12	7 to 12	35	12
Butt Weld, extra strong, plain ends			Butt Weld, extra strong, plain ends			Butt Weld, extra strong, plain ends		
1/4, 1/2 and 3/4	40	22 1/2	1/4, 1/2 and 3/4	22	5	1/4, 1/2 and 3/4	22	5
1/2	46	32 1/2	1/2	27	14	1/2	27	14
3/4 to 1 1/2	49	36 1/2	3/4 to 1 1/2	33	18	3/4 to 1 1/2	33	18
2 to 3	50	37 1/2						
Lap Weld, extra strong, plain ends			Lap Weld, extra strong, plain ends			Lap Weld, extra strong, plain ends		
2	42	30 1/2	1 1/4	19	4	1 1/4	19	4
2 1/2 to 4	45	33 1/2	1 1/2	25	11	1 1/2	25	11
4 1/2 to 6	44	32 1/2	2	27	14	2	27	14
7 to 8	40	26 1/2	2 1/2 to 4	29	17	2 1/2 to 4	29	17
9 to 12	35	21 1/2	4 1/2 to 6	28	16	4 1/2 to 6	28	16
			7 to 8	20	8	7 to 8	20	8
			9 to 12	15	3	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh, announced Nov. 13, as agreed upon by manufacturers and the Government:

Lap Welded Steel		Charcoal Iron	
3 1/2 to 4 1/2 in.	34	3 1/2 to 4 1/2 in.	12 1/2
2 1/2 to 3 1/2 in.	24	3 to 3 1/2 in.	+ 5
2 1/4 in.	17 1/2	2 1/2 to 2 3/4 in.	+ 7 1/2
1 1/2 to 2 in.	13	2 to 2 1/2 in.	+ 22 1/2
		1 1/2 to 1 3/4 in.	+ 35
Standard Commercial Seamless—Cold Drawn or Hot Rolled		Standard Commercial Seamless—Cold Drawn or Hot Rolled	
Per Net Ton		Per Net Ton	
1 in.	\$340	1 1/4 in.	\$220
1 1/4 in.	280	2 to 2 1/2 in.	190
1 1/2 in.	270	2 1/2 to 3 1/2 in.	180
1 3/4 in.	220	4 in.	200
		4 1/2 to 5 in.	220

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots, are as follows:

Blue Annealed—Bessemer		Blue Annealed—Bessemer	
Cents per lb.		Cents per lb.	
Nos. 8 and heavier	4.20	Nos. 17 to 21	4.80
Nos. 9 and 10	4.25	Nos. 22 and 24	4.85
Nos. 11 and 12	4.30	Nos. 25 and 26	4.90
Nos. 13 and 14	4.35	No. 27	4.95
Nos. 15 and 16	4.45	No. 28	5.00
		No. 29	5.10
		No. 30	5.20
Box Annealed, One Pass Cold Rolled—Bessemer		Box Annealed, One Pass Cold Rolled—Bessemer	
Cents per lb.		Cents per lb.	
Nos. 10 and 11	5.25	Nos. 15 and 16	4.50
Nos. 12 and 14	5.35	Nos. 17 to 21	4.85
Nos. 15 and 16	5.50	Nos. 22 to 24	4.90
Nos. 17 to 21	5.65	Nos. 25 and 27	4.95
Nos. 22 and 24	5.80	No. 28	5.00
Nos. 25 and 26	5.95	No. 29	5.05
No. 27	6.10	No. 30	5.10
No. 28	6.25	Nos. 30 1/2 and 31	5.10
No. 29	6.50		
No. 30	6.75		
Tin-Mill Black Plate—Bessemer		Tin-Mill Black Plate—Bessemer	
Cents per lb.		Cents per lb.	
Nos. 15 and 16	4.50	Nos. 17 to 21	4.85
Nos. 17 to 21	4.85	Nos. 22 to 24	4.90
Nos. 22 to 24	4.90	Nos. 25 and 27	4.95
Nos. 25 and 27	4.95	No. 28	5.00
No. 28	5.00	No. 29	5.05
No. 29	5.05	No. 30	5.10
No. 30	5.10	Nos. 30 1/2 and 31	5.10

Pittsburgh and Nearby Districts

Reports that the Pennsylvania Engineering Works, New Castle, Pa., would make large additions to its works are incorrect. The company states it has no plans for any additions under way at present.

The Bond Foundry & Machine Co., Manheim, Pa., builder of power transmitting specialties, is making additions to its pattern shop to cost about \$3000. No new tools will be needed at present.

Probably this week, the Zanesville blast furnace of the Carnegie Steel Co., Pittsburgh, will be put in blast after being idle about three years. This will leave only two stacks of the company idle, they being Edgar Thomson stacks at Bessemer, Pa., which are being rebuilt.

The blast furnace of the Stewart Iron Co., Ltd., Sharon, Pa., which has been idle for about two months for relining and repairs, has been started. The furnace operates on low phosphorus iron.

The Ordnance Department, United States Steel Corporation, has placed a contract with the United Engineering & Foundry Co., Pittsburgh, for four 6000-ton United hydraulic forging presses, to be installed in the Neville Island gun and projectile plant. The contract calls for the delivery of the first of these presses in about 10 months.

The Truscon Steel Co., Youngstown, Ohio, is installing a pressed steel department in charge of G. F. Danielson, formerly head of the pressed steel department of the Youngstown Iron & Steel Co. and of its successor, the Sharon Steel Hoop Co. The new department will occupy one of the new unit buildings, 80 x 400 ft. Equipment is being installed and the department will be extended as conditions warrant. The company has already received large Government orders to be filled by this new department.

The American Sintering Co. has built and is now operating a large addition to its sintering plant at Youngstown, Ohio, and is now equipped to handle 16,000 tons of blast furnace flue dust monthly. The new addition cost about \$100,000.

The Pennsylvania Railroad will build a new turntable and make large additions to its shops at Blairsville, Pa.

The Republic Iron & Steel Co., Youngstown, Ohio, is in the market for equipment for a machine shop at its open-hearth steel works, and is said to have already placed some large orders for machine tools with the Motch & Merryweather Machinery Co., Cleveland.

The Youngstown Foundry & Machine Co., which will build a new foundry and machine shops at Girard, Ohio, will be in the market for a large amount of equipment.

Property owners of McDonald, the new town being developed by the Carnegie Steel Co., near Youngstown, have asked county authorities that their community be incorporated. About 200 houses are completed or under construction at McDonald. Two bar mills and a hoop mill are in operation. A population of several thousand is predicted for the town in the near future. The War Department has granted permission for the construction of a bridge across the Mahoning River to connect with the main route of travel to Youngstown.

Invoice Prices of Southern Iron

A large selling agency for Southern iron reports average invoice prices this year on No. 2 foundry, Birmingham, as follows: January, \$32.20; February, \$33.15; March, \$34.30; April, \$33.90; May, \$35; June, \$33.60. The average invoice price June, 1917, was \$19.85.

The businesses of the Organ Power Co., Hartford, Conn., builder of blowing equipments for organs, and that of the Spencer Turbine Cleaner Co., also of Hartford, maker of turbine blowers, exhausters and vacuum cleaning apparatus, were merged on July 1, and will in the future be conducted by the Spencer Turbine Co.

Fabricated Steel Business in June

In June 56 per cent of the country's capacity for bridge and general structural steel building work was put under contract, according to the records of the Bridge Builders and Structural Society, George E. Gifford, 50 Church Street, New York, secretary. This corresponds to about 100,750 tons, or the average monthly rate so far this year. The June total is about 7000 tons below that of May, which was 7000 tons less than April. As compared with the first half of last year, the six months' business of this year, totaling 604,000, is about 32,500 tons less, and the fabricated ship movement then had not yet got under way. After March, 1917, fabricating business fell off for six months at a rate of about 11,750 tons monthly, dropping to 52,000 tons for the month of September, 1917. Then with the war buying in full swing business was taken on in the next three months at a rate increasing over 50,000 tons monthly. In considering present figures it is to be remembered that fabricating plants are nearer their theoretical limits than seems to be the case in the light of the percentages, owing to the scarcity and low efficiency of the labor.

Contracts for 61 Vessels

WASHINGTON, July 23.—During the week ending July 13, contracts for 61 vessels, representing 439,800 dead-weight tons, were let by the United States Shipping Board and Emergency Fleet Corporation. Of this tonnage 392,800 will go into steel construction, the rest into wooden ships.

To the Skinner & Eddy Corporation of Seattle went a contract for the building of 35 steel cargo steamships of a dead-weight tonnage of 332,800. The Mobile Shipbuilding Co. of Mobile, Ala., received a contract to build 12 steel freighters of a combined tonnage of 60,000, making 47 of the steel type provided for in the new contracts.

Contracts for building 14 wooden ships were divided between K. M. Murdock of Jacksonville, Fla., who will construct six of this type, with a total tonnage of 21,000, the Missouri Valley Bridge & Iron Co. of Quantico, Va., which will build seven of an aggregate tonnage of 24,500, and the Continental Shipbuilding Corporation of Yonkers, N. Y., which was given a contract for building one vessel of 1500 tons.

High Percentage Tungsten Alloys

A method of forming high percentage tungsten alloys has been patented by Hans Goldschmidt and Otis Weil and assigned to the Metal & Thermit Corporation, New York. These alloys are usually produced in electric furnaces and hence contain a percentage of carbon, sometimes prohibitive for certain uses. Former attempts by aluminothermic reactions were unsuccessful, causing large slag losses of the refractory tungsten, but good yields by the latter method were obtained by adding indifferent substances to the reacting mixture, such as lime or fluorspar, in quantity up to one quarter of the tungstic oxide used. This process may be employed for incorporating tungsten or its alloy into molten metal baths, by merely adding a mixture of ferric oxide, tungstic oxide, aluminum and lime. The pure ferrotungsten produced immediately alloys without waste, and the slag remains liquid on the surface of the bath, it is claimed.

The Carnegie Steel Co., Pittsburgh, has built near its Edgar Thomson Steel Works at Bessemer, Pa., a bunk house of brick and steel, having accommodation for about 360 men. The arrangement of the building is very similar to that used in the cantonments. The kitchen is complete in every detail. The bunks are double-tier style, and the section of the building in which they are located is light and airy. The building is 50 x 175 ft. The company has also erected more than 400 houses for its employees at various plants during the past six months, and several hundred more are being built.

Sheet Mill Wages Slightly Advanced

At the bi-monthly conference of wage committees of the Amalgamated Association of Iron and Steel Workers, and the National Association of Sheet and Tin Plate Manufacturers, held in Granite City, Ill., recently, it was found that the average price on shipments in May and June of Nos. 26, 27 and 28 black sheets was \$5.15 per 100 lb., f.o.b. Pittsburgh. This entitles sheet mill hands, working under the scale rates, to an advance of one point, or 1½ per cent, in wages for July and August. The fact that sheet mill hands are entitled to this slight advance was unexpected by the men, but is explained by the fact that the mills are running largely on Government orders, which are filled as soon as possible after being received, necessitating delay in filling of contracts placed by the commercial users some time ago, and at higher than Government price, which on No. 28 gage is 5c., this being the base of the scale.

The average price on shipments of tin plate in May and June was found to be \$8, the same as in March and April, so that the wages of tin mill hands for July and August will be the same as in the preceding four months. The high point reached in wages of sheet mill hands was in November and December, 1917, having been based on 5.50c. for No. 28 gage sheets and \$8.60 per base box on tin plate.

Work on Brier Hill Steel Co. Furnace Delayed

Owing to delays in receipt of materials and also to scarcity of labor, work on the new 500-ton blast furnace of the Brier Hill Steel Co., Youngstown, Ohio, has not advanced as rapidly as expected, and this stack will not be ready for blast probably until early September. The company is badly in need of the iron, having made its plans to have the furnace in operation about July 1, and will probably have to secure pig iron from outside sources until the new furnace is ready for operation. The ore bridge and the car dumper in connection with the new furnace are about completed, and the ore bins in the ore yard will be finished in a short time. A large retaining wall being built by the company along the Mahoning river is nearly finished.

The company has also had under way for some months the building of one 32 x 84-in. tandem plate mill and one 38 x 132-in. three-high plate mill, all to be electrically driven. These mills are being built complete by the United Engineering & Foundry Co., Pittsburgh, but will not be ready for operation for 60 days or more. The two mills will have a monthly capacity of close to 8000 tons of sheared plates.

Additions to Plant of Braeburn Steel Co.

To insure a continuity of supply of the high-grade alloy steels used in its various products, the Marlin-Rockwell Corporation recently acquired the plant of the Braeburn Steel Co. of Braeburn Pa., as stated in THE IRON AGE of June 13. Plans have been made for extensive development of this property by the additional equipment of a 6-ton electric furnace, thus making available two furnaces of this capacity.

The increasing needs of the Standard Roller Bearing Co., Philadelphia, and the large requirements of the Marlin Arms factory at New Haven, Conn. (both of which are now owned by the Marlin-Rockwell Corporation) have resulted in bringing this source of steel supply within its organization. With its other sources of supply, this provides additional assurance of an adequate quantity of these high-grade materials. High-speed tool steels and electric steels will continue to be manufactured under the new ownership of the Braeburn company.

The Ordnance Department, Washington, has awarded a contract to Smith, Hauser & MacIsaac, Inc., 18 East Forty-first Street, New York, for the construction of a new plant at Curtis Bay, Md., to cost about \$4,000,000. The works will consist of a series of magazine and ammunition buildings.

Standardizing of Screw Threads

WASHINGTON, July 23.—Pursuant to the terms of the so-called Tilson Act, recently passed by Congress, authorizing the appointment of a commission to standardize screw threads, the Secretary of Commerce has promulgated a statement in part as follows:

The purpose of the commission is to ascertain and establish standards of screw threads for acceptance and adoption in manufacturing plants under control of the War and Navy Departments, and, as far as practicable, for screw threads in general use throughout the United States.

Nine commissioners are to be appointed, one of whom shall be the director of the Bureau of Standards, who will be chairman of the commission; two commissioned officers of the Army, to be appointed by the Secretary of War; two commissioned officers of the Navy, to be appointed by the Secretary of the Navy; and four to be appointed by the Secretary of Commerce, two of whom shall be chosen from nominations made by the American Society of Mechanical Engineers and two from nominations made by the Society of Automotive Engineers. The commission shall cease at the end of six months from the time of its appointment.

There are mentioned herewith several items in connection with screw-thread standardization which will probably be brought before the commission for consideration.

(1) Consideration as to type of thread to be used, such as U. S. Standard form, Whitworth form, or International thread form.

(2) Establishment of dimensions and tolerances for U. S. standard threads; A. S. M. E. threads, and also fine pitch threads which will result in interchangeable screws and nuts of different grades.

(3) The establishment of rules or formulas which will specify such tolerance and dimensions as to insure interchangeability and to provide for different grades of work.

As prompt action is anticipated, the commission should be ready to begin its work in the course of a few weeks. Its members will serve without compensation, but it is understood that all necessary expenses will be borne by the Government.

While the law does not make compulsory upon all private manufacturers the adoption of such standards as may be agreed upon by the commission, nevertheless it is expected that the new standards will be generally accepted and in a short time will become practically universal. The provision of the new statute with respect to the adoption of standards is as follows:

That it shall be the duty of said commission to ascertain and establish standards for screw threads, which shall be submitted to the Secretary of War, the Secretary of the Navy, and the Secretary of Commerce for their acceptance and approval. Such standards, when thus accepted and approved, shall be adopted and used in the several manufacturing plants under the control of the War and Navy Departments, and, so far as practicable, in all specifications for screw threads in proposals for manufactured articles, parts, or materials to be used under the direction of these departments.

The debates on the Tilson bill in the House and Senate developed the fact that the officials who will have charge of the enforcement of the law are opposed to the use of drastic methods to compel the adoption of standards, and in all cases where the innovations are likely to affect machinery now in use, efforts will be made to postpone the adoption of changes until such machinery is worn out. All new machinery, however, will be expected to be built in accordance with the new standards.

Enemy Aliens in the American Electrochemical Society

The American Electrochemical Society has decided to weed out all enemy aliens from its membership, as the result of recent action by its board of directors. Resolutions similar to those recently adopted by other technical societies have been passed and sent to each member, accompanied by a postal card, asking data as to citizenship and requesting that members who are considered enemy aliens or who do not support the aims and ideals of the United States in the war file an answer by letter to the board for its meeting at the Niagara Club, Niagara Falls, N. Y., Aug. 24.

PERSONAL

Frank H. Crockard has resigned as president of the Nova Scotia Steel & Coal Co., New Glasgow, Nova Scotia. His successor is Donald H. McDougall, general manager of the Dominion Iron & Steel Co., Sydney, Nova Scotia. Mr. Crockard resigned last year as vice-president and general manager of the Tennessee Coal, Iron & Railroad Co. to accept the presidency of the Nova Scotia company, which at that time had in contemplation a considerable program of new construction. Mr. McDougall was appointed assistant general manager of the Dominion Coal Co. in 1909 and had to do with the settlement of a serious strike then under way at the company's mines. He has had almost a continuous connection with the enterprise at Sydney from the beginning, being successively resident engineer and resident manager of the Wabana iron mines, superintendent of mines and quarries, and since the beginning of 1916, general manager of the Dominion Iron & Steel Co. The steel company properties have undergone extensive expansion under his supervision. He will enter upon his duties with the Nova Scotia Steel & Coal Co. in early August.

Andrew Wheeler, of Morris, Wheeler & Co., Philadelphia, has gone to Washington on the invitation of J. Leonard Replogle, Director of Steel Supply, to take care of warehouse steel distribution under regulations that have been established by the War Industries Board. Representatives of various iron and steel trade associations were called to Washington by the Priorities Committee a few weeks ago with the idea of forming a trade committee to advise with the Priorities Committee in passing on distributors' priority applications. Mr. Wheeler was the nominee of the Iron, Steel and Heavy Hardware Association for that committee. However, since the new regulations do away to a large extent with distributors' priorities, the committee plan has been abandoned.

J. K. Jensen, Melbourne, Australia, representing the Department of Defense, will spend some time in the United States shortly, en route to England on duty connected with the establishment of a Government arsenal in Australia. While in New York, he will receive catalogs and information from interested concerns regarding all classes of plant equipment and tools suitable for the production of guns, ammunition, small arms, cars and airplanes, as well as general factory equipment. He can be addressed in care of the Australian Customs Representative, South Ferry Buildings, 44 Whitehall Street, New York.

John A. McGregor, president Union Iron Works Co., San Francisco and Pacific Coast representative of the Bethlehem Shipbuilding Corporation, has been chosen to head San Francisco's Patriotic Committee of One Thousand. He will direct the local campaign for the fourth Liberty loan, expected to be called early in October.

James A. Green, president Matthew Addy Co., Cincinnati, is spending a month's vacation in Canada.

C. A. Seeley is now associated with E. A. Schwarzenberg, scrap iron dealer, 1540 Guardian Building, Cleveland, with whom he was formerly connected.

Stephen C. Mason, secretary of the McConway & Torley Co., Pittsburgh, was recently elected president of the National Association of Manufacturers, in which organization he will represent the railway supply industry. He has been affiliated with railroad work all his life, commencing in November, 1880, as station agent at Lyndonville, Vt., and for the last 22 years has been affiliated with the McConway & Torley Co.

Classification committees have been appointed by the Pittsburgh Region War Resources Committee. The members of the committee on iron and steel products are as follows: A. M. Harper, Carnegie Steel Co., chair-

man; H. S. Bickle, Fort Pitt Bridge & Iron Works, representing structural work; I. F. Lehman, Blaw-Knox Co., plate work; J. G. Deericks, Pittsburgh Steel Co., wire nails and wire mills products; Henry Oliver, Oliver Iron & Steel Co., bolts, nuts and rivets; Joseph V. Smith, Hubbard & Co., shovels and spades; H. S. Spangler, McKinney Mfg. Co., general hardware; E. L. Parker, Columbia Steel & Shafting Co., shafting; James H. Hammond, Superior Steel Corporation, cold-rolled strip steel and similar products. The machine shop work committee follows: Charles J. Mesta, Mesta Machine Co., chairman; H. D. Wilson, Wilson-Snyder Mfg. Co.

Ernest Humbert, the electric furnace expert, first associated with Heroult, is now again living in Welland, Ont., at 191 Division Street, far on the road to recovery from the long months of illness following an attack of typhoid fever.

Col. David Carnegie, ordnance adviser and member of the Imperial Munitions Board of Canada, Ottawa, arrived in England about July 8.

Bennett Chapple, a partner of Chapple Brothers, Boston, owners of the National Magazine, and who has been one of its editors, has been appointed director of publicity of the American Rolling Mill Co., Middletown, Ohio. Mr. Chapple has had some 20 years' experience in advertising and journalistic work.

Guy Ellis, who for several years has been with the Henry Vogt Machine Co., for a time sales manager, and later manager of the foundry and forging department, has resigned and gone to Philadelphia, where he is now connected with the Emergency Fleet Corporation.

Otto A. Berger, president, and William A. Folger, second vice-president of the Berger & Carter Co., San Francisco, are on a five weeks' visit to the machine tool manufacturers in the East.

Lewis Russell, president and general manager, Russell, Holbrook & Henderson, Inc., New York, has resigned as general manager to join the Ordnance Department, U. S. A. L. G. Henderson, secretary and treasurer of the company, has recently gone into the Coast Artillery Corps. G. E. Schultz, formerly with the industrial department of the Westinghouse Electric & Mfg. Co., has accepted the position of manager of Russell, Holbrook & Henderson, Inc.

The American Steel Export Co., New York, has just announced the appointment of Philippe Berger, 2 Square de l'opera, Paris, as its general agent for France and Belgium. This company recently announced the opening of a branch office at Rio de Janeiro with J. D. W. Snowden as manager. Other officials of the company engaged in building up foreign trade connections now abroad include F. H. Tackaberry, who is covering South America; E. W. Ames, the Far East; and C. S. Vought, in Europe.

J. M. Wilson has resigned as editor-in-chief of *Canadian Machinery*, and allied publications of the MacLean Publishing Co., Ltd., Toronto, to accept a position on the engineering staff of the Standard Parts Co., Inc., Cleveland.

R. T. Turner of the New York office of the Shepard Electric Crane & Hoist Co. has joined the National Army.

C. B. Cushwa, general superintendent of the Haselton and Lowellville, Ohio, plants of the Sharon Steel Hoop Co., Sharon, Pa., has resigned, effective Sept. 1. He has not made any definite plans for the future. Mr. Cushwa went to the Youngstown Iron & Steel Co., then the Youngstown Iron & Steel Roofing Co., in 1902, from the National Tube Co., Pittsburgh, to assume charge of the construction and operation of its plant. He is a director of the Sharon Steel Hoop Co., and also of the Commercial National Bank of Youngstown.

H. W. Craig has been made manager of sales in the Chicago district for the Republic Iron & Steel Co., succeeding C. H. Eib, resigned. The latter has associated himself with the Pettibone, Mulliken Co., Chicago. Mr.

Craig has been with the Republic Iron & Steel Co. 19 years.

G. Stanley Porter, until recently factory manager for the Jackson Rim Co., Jackson, Mich., has resigned to become associated with the Hayes Wheel Co. of that city, and will have charge of the manufacture of fabricated steel wheels for tractors and trucks.

Horace H. Esselstyn, former resident engineer of the United States Shipping Board, Emergency Fleet Corporation, Hog Island, became commissioner of public works in Detroit last week, having been appointed by Mayor Marx. Mr. Esselstyn is president of the firm of Esselstyn, Murphy & Hanford, engineers and architects, Detroit.

Capt. William J. Richards, during the last 18 years general superintendent of the iron ore mines of the McKinney Steel Co., on the Menominee and Gogebic ranges, has retired from active service, but will continue his connection with the company in an advisory capacity. He has been succeeded by Emerson D. McNeil, who was in charge as general superintendent of the properties of the McKinney Steel Co., on the Mesaba range, Minn.

William Harman Black, New York, chosen by Frank P. Walsh to be his alternate as co-chairman of the National War Labor Board, was born in Georgia 50 years ago, is a graduate of Columbia University, and practiced law in Atlanta until 1900, when he went to New York. He is special counsel for the city of New York, in condemnation of lands for the Catskill water project. He has held several official positions in New York, including that of acting district attorney in 1917.

Clarence Boyer, formerly with the Cincinnati Shaper Co., has been appointed private secretary of R. K. LeBlond, president R. K. LeBlond Machine Tool Co., Cincinnati.

John D. Ryan, Director of Aircraft Production, has named C. W. Nash, president of the Nash Motor Co., Kenosha, Wis., as assistant to the director in charge of engineering and production.

Major General William Crozier, former Chief of Ordnance, has been assigned to command the Department of the Northeast at Boston. He relieves Brigadier General John W. Ruckman.

German Copper Importations After the War

Many conferences have been held between representatives of the metal trades and the German Government on the subject of the organization of the trade and the importation of metals in the transition period after the war, and various proposals have been considered, says the London *Ironmonger*. So far, however, no scheme has been either definitely refused or accepted. The large copper manufacturing firms, which are very powerful, have proposed the formation of a Raw Copper Supply Co., which would leave little room for the established merchant trade. This proposal has met with strong opposition from the Berlin and Hamburg Copper Exchange, which claim that no scheme can be permanently successful unless the middleman receives greater recognition. The various metal trades associations demand that the home distribution of metals at any rate shall be left free, although it is recognized that there will have to be some system of allotment. This arrangement would leave metal merchants free to trade in the stocks of copper which at present are held at war prices in the warehouses of the controlling bodies, but which sooner or later will have to be released.

The government suggests that the War Metal Co., which now controls the supplies, should continue to exist in a modified form and to act as a kind of reservoir for the transition period, with the object of preventing any loss in value falling upon the public purse. It is impossible to foretell what will be the upshot of the discussions, but there is a strong inclination to leave the import trade for the next few years in the hands of organizations wholly or partially controlled by the state.

OBITUARY

CHARLES ALLIS, president Chicago Belting Co., died July 22 at Milwaukee, aged 65 years. He was chairman of the Milwaukee County Council of Defense, to which he has been giving much time since the beginning of the war. Mr. Allis was the first president of the reorganized Allis-Chalmers Co., and was connected with many business enterprises of Milwaukee. He was a son of the late Edward P. Allis.

JAMES DAMEZ, president Damez Foundry Co., 7380 South Chicago Avenue, Chicago, died July 16, in the Illinois Central Hospital, aged 70 years, from injuries received in his plant when an emery wheel burst. He had been in the foundry business in Chicago for 40 years. He was born in Alsace-Lorraine, and leaves his wife and five sons.

CHAUNCEY P. GOSS, Sr., president Scovill Mfg. Co., brass manufacturer, died at his home in Waterbury, Conn., July 19, aged 80 years. He entered the office of the Scovill company in 1862 and had been president and treasurer since 1900. He leaves two daughters and four sons, one of whom is serving in the Army in France.

WILLIAM MORRIS, managing director of the Baglan Tin-plate Co., Ltd., in South Wales, England, and one of the men instrumental in the formation of the Tin Plate Conciliation Board, died June 15 at Briton Ferry, Wales. He was a member of the Iron and Steel Institute.

Manganese Ore in Nevada

Details of a newly developed deposit of manganese in White Pine County, Nevada, are embodied in a bulletin prepared for the U. S. Geological Survey by J. T. Pardee, who recently made a reconnaissance of the district covering an area about 50 miles long by 20 miles wide, comprising part of Steptoe Valley, and the mountains that border it on the east and west. The manganese ore extends from the surface to a depth of 50 ft. or more. Practically all the deposits occur in limestone and are associated with bodies of jaspery quartz. The ore bodies are irregular pipes, pockets, and lenses that range from a few feet to 70 ft. or more in length and from a few inches to 10 or 20 ft. in width. Several of the larger bodies contain from 500 to 1000 tons or more. The bulk of the ore is composed of the softer manganese oxides, pyrolusite being predominant in some mines and wad in others.

The ore mined contains from 36 to 45 per cent of manganese, 3 to 16 per cent of silica, 3 to 5 per cent of iron, a moderate amount of lime, and very little phosphorus. An output of 2108 net tons of 40 per cent manganese ore was produced by seven operators up to June 1, 1918, the first shipments having been made late in 1917. About 550 tons a month is now being shipped from the Ely and Nevada districts.

The high-grade manganese ore (40 per cent manganese and low silica) now in sight is estimated at 5450 tons; the ore containing 15 to 40 per cent manganese and high silica, at 5000 to 12,000 tons; the ore containing 15 to 40 per cent manganese and high iron, at 1650 to 4000 tons; and the sulphide and silicate ore carrying 20 to 35 per cent manganese and 20 to 37 per cent silica at 1000 to 3000 tons.

The Engineers' Club of St. Louis has under consideration plans for the establishment of a research laboratory somewhat along the lines of the Mellen Institute of Pittsburgh and the Burgess Laboratories of Madison, Wis., except that it is intended the St. Louis laboratory shall be available to the smallest manufacturer with a puzzling mechanical or chemical problem as well as to the larger concerns. The plans are being worked out by a committee headed by Charles S. Ruffner, president of the club.

Bridgeport, Conn., Wage Hearings Closed

Compilations of Facts and Figures
from Report of Statistical Committee
—Board's Award Expected Aug. 1

The hearings in the Bridgeport, Conn., wage adjustment case were resumed July 17 before examiner W. J. Stoddard of the National War Labor Board. The first day was taken up by evidence presented by the union officials of alleged discrimination and by evidence presented by the employers that classification of workers by the board and the establishment of a high minimum wage would lessen the production of essential war materials by causing disruption of the working forces of the city.

The second and closing day was given over largely to the presentation of the case of the polishers by officers of their union and to the presentation of the report of the statistical committee created by the employers to investigate the cost of living and wage conditions in the city. A large number of graphic charts and tabulations were shown by means of a large reflectoscope and were explained by the chairman of the committee, W. E. Freeland, New England editor of *THE IRON AGE*. Both the direct examination and the cross-examination of the chairman developed the fact that both parties to the controversy considered the problem of classification of workers of at least equal importance to the question of wage adjustments and minima for the various kinds of labor.

In the issue of July 18, *THE IRON AGE* gave a digest of the facts brought out in the statistical report. In addition to the figures there given, some interesting comparisons were made of wage conditions in the weeks of Jan. 16, 1915, and June 22, 1918. In Table I are shown various figures outlining changes in the number of employees, hours worked, earnings, etc. It will be noted that the amount earned has increased materially more than either the number of employees or the hours worked. This increase results from the large increase in the rates of pay. The percentage of increase in the actual number of hours worked is important as showing the insignificant extent to which the increase in the hours of labor has contributed to the increased weekly earnings.

In Table II are shown the average weekly earnings of groups of employees in some typical operations. This compilation did not appear in the original report and is simply an average of the averages shown by the shops reporting on each group of workers and is not weighted to obtain absolute values, as are other averages used in the report. As the male workers worked only 3.6 per cent more hours in 1918 than in 1915, and the female workers worked 6.5 hr. less in 1918 than in 1915, this table emphasizes the opportunity which the workers now have to increase their earnings greatly in order to keep up with the increase in the cost of living in Bridgeport, which is reported to be 61.4 per cent.

Less Working Hours Per Week

One of the charts forming a part of the report compared the nominal working hours for male employees in 1915 and 1918. It showed in general that the nominal working hours are less in 1918 than in 1915 and showed specifically that 50 per cent of the male employees in 1915 had a regular working week of 54 hrs.

Table I—Comparative Figures for January, 1915, and June, 1918, in 31 Male Occupations and 23 Typical Industrial Plants in Bridgeport, Conn.

	1915	1918	Per Cent of Increase
Number of employees.....	4,485	10,260	129
Hours worked	230,102	545,498	94
Amount earned	\$69,436	\$282,060	306
Earnings per employee per week. \$15.46		\$27.45	78
Earnings per employee per hour. \$0.301		\$0.517	72
Hours worked per employee.....	51.3	53.2	3.6

or more, whereas in 1918 the corresponding figure was 47 hrs. or more.

The average hourly earnings, the per cent of increase and the relative rank of each of the 33 barometer occupations that were investigated are compared in Table III. These are all weighted averages and show some interesting wage fluctuations between the different occupations. Planer operators show the largest percentage of increase, 114, having gone from 31.1 cents an hour in 1915 to 66.5 cents an hour in 1918. Gagemakers, who ranked second in hourly earnings in 1915, have moved to first position in 1918 but have been exceeded in percentage of increase by 20 other occupations. Women inspectors show the second largest increase in percentage of increase. This is due largely to their employment on more highly skilled and therefore better paid work. Lathe and drill press operators show increases exceeding 100 per cent and other occupations which show increases of 90 per cent or more are die sinkers, machinists, precision grinders, milling machine operators, machine shop filers and fitters, molders, millwrights' helpers, and women machine operators.

Table II—Average (Unweighted) Earnings in Typical Occupations in Bridgeport, Conn., for Week Ended June 22, 1918

Occupation	June 16, 1915	June 22, 1918
Gage makers	\$22.70	\$42.50
Die sinkers	20.63	35.88
Toolmakers	19.88	39.19
Machinists	18.72	33.26
Lathe operators	15.91	28.38
Planer operators	18.80	32.77
Precision grinders	19.56	35.02
Milling machine operators.....	14.52	27.59
Auto screw machine operators....	15.67	27.79
Hand screw machine operators....	15.59	26.24
Blacksmiths	22.14	32.11
Machine shop filers and fitters....	15.81	30.39
Drill press operators.....	14.61	23.67
Machine set-up men.....	16.84	27.69
Molders	14.18	31.99
Coremakers	12.61	24.43
Drop forgers	22.59	36.04
Patternmakers	18.74	29.88
Polishers	14.28	24.49
Millwrights	18.82	32.70
Women inspectors	6.99	12.99

For the 33 barometer occupations the average hourly earnings in 1915 were 26.8c an hour, and in 1918 47.8c an hour.

Another series of charts in the original report showed that for the 31 male occupations, the average earnings per hour were 30.1 cents in 1915 and 51.7 cents in 1918, an increase of 72 per cent.

An interesting series of charts showed by means of accumulative frequency curves the number of employees grouped according to nominal hourly rates. A chart of all the occupations showed that 90 per cent of all male employees in 1918 are earning more than was earned by the highest 7 per cent in 1915. The lowest hourly earnings in 1918 are approximately the same as the highest hourly earnings in 1915.

The investigation showed a wide range of nominal hourly rates in the various occupations, in some cases 16 different rates being found in one factory in one occupation. Tabulations were made for each occupation investigated in each factory, showing the number of men at each rate for each of the two weeks selected for comparison. These tabulations peculiarly emphasized the complexity of the problem of setting a correct minimum for any group classed by occupation and also plainly showed by the divergence in rates that there was no clear line of demarcation between the different

Table 111—Comparison of Average (Weighted) Hourly Earnings in Cents in 33 Occupations in 23 Industrial Plants in Bridgeport, Conn.

No.	Occupation	Aver. Hourly Earnings—		Per Cent of Increase	Rate in Wage Rate		In per Cent of Increase
		1915	1918		1915	1918	
1	Gas makers	42.8	78.1	82	3	2	18
2	The sinkers	39.9	77.8	95	4	3	7
3	Toolmakers	37.2	70.0	89	7	4	13
4	Machinists	33.8	65.0	92	8	7	11
5	Lathe operators	30.01	60.8	102	15	9	3
6	Planer operators	31.1	66.5	114	12	5	1
7	Precision grinders	33.0	65.5	98	9	6	6
8	Milling machine operators	26.5	51.0	92	24	21	12
9	Automatic screw machine operators	32.3	56.0	73	10	13	26
10	Hand screw machine operators	28.1	51.2	82	21	20	19
11	Blacksmiths	37.6	60.5	61	6	10	30
12	Blacksmiths' helpers	22.5	40.7	81	28	28	29
13	Machine shop filers and fitters	28.2	55.0	95	20	14	8
14	Drill press operators	26.7	53.8	101	23	15	4
15	Shaper operators	59.2	59.0	00	1	11	33
16	Machine set-up men	28.4	49.9	75	19	22	25
17	Molders	29.6	58.4	99	18	12	5
18	Core makers	25.6	48.0	87	25	23	14
19	Drop forgers	43.4	78.3	80	2	1	21
20	Pattern makers	38.0	61.5	62	5	8	29
21	Polishers	30.3	53.8	77	13	16	24
22	Millwrights	29.9	53.8	80	16	17	22
23	Millwrights' helpers	22.0	42.6	94	29	27	10
24	Carpenters	30.2	51.2	70	14	19	27
25	Carpenters' helpers	25.0	45.8	83	27	26	17
26	Pipers	29.8	47.6	60	17	24	31
27	Pipers' helpers	20.9	37.0	77	31	31	23
28	Painters	25.3	47.4	87	26	25	15
29	Common laborers	26.9	37.9	41	22	30	32
30	Electricians	31.6	52.5	66	11	18	28
31	Electricians' helpers	21.2	39.7	87	30	29	16
32	Women machine operators	15.5	30.2	95	32	33	9
33	Women inspectors	15.2	31.0	104	33	32	2
Averages		26.8	47.8	79			

classes. The manufacturers put up a stronger argument that they be left undisturbed in their present classifications and in their methods of paying men on a basis of skill, ability and dependability in order that the record of the city for executing promptly its war contracts might not be threatened by the introduction at this time of so controversial a subject as the reclassification of industrial workers.

The award of the National War Labor Board is to be handed down as near Aug. 1 as possible. As 53 factories, including most of the larger industries, have agreed to abide by the decision of the Board, its award will be awaited with great interest, as the report, from which the tables shown herewith have been prepared, indicates that only one large occupational group (common laborers) shows an increase materially less than the increase in the cost of living. Three occupations show increases practically equal to the increase in the cost of living. Of the remainder, all show increases exceeding that in the cost of living, many by a large percentage.

Investigating Production Costs

WASHINGTON, July 23.—The Federal Trade Commission is now conducting or has just completed investigations of production costs into some 20 industries for the confidential use of the war branches of the Government.

Of these, the commission's economic division reported, two were undertaken for the Fuel Administration, 12 for the War Industries Board, three for the Food Administration, and one each for the Railroad Administration and the Army.

Complete figures and data on the cost of production are being furnished by the commission. Much of this, it is expected, will be used in determining fair prices on commodities purchased by the Government and in some instances the general public.

The investigations embrace cost inquiries into bituminous coal, petroleum, coke, pig iron, ingots, rolled steel products, copper, zinc, nickel, lumber, sand and gravel, locomotives, canned foods, textiles, military food supplies, meats and grains.

The plant of the Donner-Union Coke Corporation, to be located at Abby and Bell streets, Buffalo, on the Lackawanna and South Buffalo Railroads, upon which construction work is about to be commenced, will consist of 150 ovens and a complete benzol plant.

Form of Pledge for Jobbers' Customers

Joseph T. Ryerson & Son, Chicago, New York, Detroit and St. Louis, have sent the following letter and pledge to all their customers:

"We are enclosing copy of a pledge which we have signed, in accordance with request of the War Industries Board. Please note that portion reading:

"We will make no sale or delivery from such stocks to any customer or retailer before his filing with us a similar pledge in writing."

"It will therefore, be necessary for you to give us a similar pledge before we can make shipments to you.

"In addition to this pledge, it is essential that you give the ultimate use for which material will be used on each individual order. This is expedient due to the fact that we must report to the Government the tonnages we ship, classified under the various heads that they list as most vital to the conduct of the war."

The pledge follows:

Joseph T. Ryerson & Son,
Chicago.

Gentlemen:

We do hereby pledge ourselves not to use or, so far as lies within our power, permit the use of, any stocks now in or which may hereafter come into our possession or control, save (1) for essential uses as that term may be defined from time to time by the priorities division of the War Industries Board, or (2) under permits in writing signed by the Director of Steel Supply; that we will make no sale or delivery from such stocks to any customer or retailer before his filing with us a similar pledge in writing; and that we will use our utmost endeavor to prevent the hoarding of stocks and to insure that they be distributed solely for essential uses.

Algoma Steel Corporation Operations

The Algoma Steel Corporation, Sault Ste. Marie, Ont., closed its fiscal year June 30. The financial statement is now in course of preparation and will not be ready for publication until the middle of next month. In the meantime an official of the company states that the production of steel ingots during the year just closed was 500,000 tons, a new high record. It will be recalled that 25 coke ovens were being installed which should have been completed by June 30. Owing to difficulty in securing materials, these will not be finished for at least another month. In addition to this work has been commenced on an additional 25 coke ovens, which are to be completed next December. This will give the company 160 ovens in all. The four blast furnaces are now operating, and the production of steel ingots is running around 50,000 tons per month, so that the production this year should exceed by 100,000 tons the production of last year. Orders on the books are sufficient to keep the plants operating to capacity well into 1919.

Squantum Yard Establishes Record

The Delphy, the first destroyer built at the new Squantum yards, Quincy, Mass., of the Fore River Works, Bethlehem Shipbuilding Corporation, was launched July 18. Its keel was laid April 20 by Secretary of the Navy Daniels. The construction of this 10-way yard was begun Oct. 10, 1917, and it is believed that the launching of the first destroyer establishes a new world's record for such construction. It is expected that one destroyer will be launched each eight days, the program calling for the construction of 35 destroyers by June 1, 1919. The destroyer was named in memory of Richard Delphy, who was commissioned a midshipman in 1808 and was killed in the fight between the United States ship *Argus* and the British frigate *Pelican* in 1813. Mrs. W. S. Sims, wife of Vice-Admiral Sims, who is in command of the American fleet in European waters, christened the vessel.

The Hurwitz Brothers Iron & Metal Co., 540 Tracy Street, Syracuse, N. Y., has increased its capital from \$50,000 to \$100,000.

Metal Companies Taken Over

A. Mitchell Palmer, Alien Property Custodian, announced Monday, July 22, that he had taken over the property of L. Vogelstein & Co. and Beer, Sondheimer & Co., Inc., and appointed directors for the two companies and for the American Metal Co. The assets of L. Vogelstein & Co. are upward of \$9,000,000 and those of Beer, Sondheimer & Co. about \$5,000,000. Mr. Palmer made a statement in part as follows:

Mr. Palmer's Statement

Beer, Sondheimer & Co., Inc., and L. Vogelstein & Co., Inc., were affiliated with the German Metal Gesellschaft, which for some years had dominated the entire metal market of the world. They dominated the metal market of this country in such a manner that they were enabled to sell copper, aluminum, zinc, and other metals in Germany at a price much lower than the American consumer had to pay.

The enemy interest in Stallforth & Co. of New York, dealers in silver bullion, with a capitalization of \$1,000,000, has also been taken over by the Alien Property Custodian. This concern was another link in the chain of the German control of the metal market of this country. F. Stallforth, the principal stockholder in this company, is now interned at Fort Oglethorpe, Ga.

With the American Metal Co., the large enemy interest in which has already been taken over by the Alien Property Custodian, Beer, Sondheimer & Co. and L. Vogelstein & Co. controlled most of the principal metal and smelting companies of this country, either by complete ownership of stock or by the ownership of enough stock to give them substantial representation of boards of directors.

Beer, Sondheimer & Co. own a one-half interest in the National Zinc Co., the entire stock of the Cuba Copper Co., the Cuba Copper Leasing Co., and the Norfolk Smelting Co., 30,000 shares of the Minerals Separation American Syndicate, Ltd.

Vogelstein & Co. have large holdings in the United States Metal Refining Co. and the Kansas Zinc & Smelting Co. Of the 70,000 shares of capital stock of the American Metal Co., 15,180 shares are owned by the Metallbank and M. C. of Frankfurt-am-Main, and 18,180 shares by the Metallgesellschaft of the same place.

The American Metal Co. completely owns the following companies: American Zinc & Chemical Co., Langeloth Coal Co., Langeloth Mercantile Co., Langeloth Townsite Co., American Metal Transport Co., Bartlesville Zinc Co., and South American Metal Co. It had large holdings of stock in the following companies: Ohio and Colorado Smelting & Refining Co., Compania Monera de Penoles, South America; Compania de Minerales Y Metales, South America; Compania Metalurgica de Torreon, South America; Compania Minero Palome Y Gabrillas, South America; Compania de Combustibles Agujita, South America; Fundicion de Guayacan, South America; Balbach Smelting & Refining Co., and Nichols Copper Co.

In 1914 the profits of Beer, Sondheimer & Co. were \$116,624; in 1915 the profits of this concern jumped to \$1,013,676, and in 1916 they reached the large total of \$2,000,000. In 1917, after the United States got into the war, the profits of this company dropped to \$196,900.

The profits of L. Vogelstein & Co. since April 1916, were extremely large, the firm's business for the last three years approximately \$70,000,000 a year. Between April and December of 1916 the profits of Vogelstein & Co. amounted to upward of \$2,500,000.

To make these concerns 100 per cent American, the Alien Property Custodian has appointed as directors Americans who are well known in the business and financial life of the country.

The New Directors

The directors named for Vogelstein & Co. are:

Edward M. McIlvain, former president of the Bethlehem Steel Co.; Louis A. Watres, president of the Scranton Trust Co., and former lieutenant-governor of Pennsylvania; Jas. N. Wallace, president of the Central Trust Co., New York; Alfred H. Smith, president of the New York Board of Aldermen, and C. C. Daniels of New York City.

The Alien Property Custodian will allow Paul L. Vogelstein and Ernest Hethern to act as directors also. Isidor J. Kresel, 37 Wall Street, New York, will act as counsel for this company.

Messrs. Wallace, McIlvain and Watres will also act as directors of Beer, Sondheimer & Co., in addition to John P. Greer, 15 Broad Street, New York, and Ford Huntington, 15 Dey Street, New York. Benno Elkan and Otto Frohnknecht will act with the above directors.

Joseph E. Davies, former chairman of the Federal Trade Commission, and Isidor J. Kresel, will act as counsel for this company.

The directors whom the Alien Property Custodian has selected to represent the enemy interest in the American Metal Co. are:

Henry Morgenthau, former ambassador to Turkey; Andrew W. Mellon, Pittsburgh; George McAneny, assistant publisher *New York Times*; Lewis L. Clark, American Exchange National Bank, New York, and E. C. Converse, Bankers' Trust Co., New York.

John J. Fitzgerald will act as counsel.

Mr. Wallace, with Francis P. Garvan, has been chosen by the Alien Property Custodian to act as director for Stallforth & Co.

L. Vogelstein & Co., and Beer, Sondheimer & Co. filed reports with the Alien Property Custodian as required by the trading with the enemy act in which they claimed that they were American-owned New York corporations. Mr. Palmer referred these reports to his Bureau of Investigation, and after several months of investigation Mr. Garvan, the director of this bureau, found that an endeavor had been made to cover up the German ownership of the assets, and that in spite of the process of Americanizing them, undertaken after the outbreak of the war, their ownership was thinly disguised.

Success of Women as Chemists

The entrance of chemically trained men into the Army munition plants and dye industries has created a labor shortage in the laboratories of the commercial chemist. To meet this contingency the laboratories at the Crompton & Knowles Loom Works, Worcester, Mass., have undertaken to employ women for laboratory assistants.

The type of work for which the women are best fitted appears to be routine determinations such as silicon, evolution sulphur and color carbon. At this plant all tests are run in duplicate until sufficient confidence can be placed in the ability of the women to do accurate work. By observing the results of numerous duplicate determinations which have extended over a period of several months it appears that the new co-workers are extremely accurate in the use of the analytical balance. The same applies to filtering and titration. The results of duplicate tests are given below to enable the reader to gain some conception of what high school graduates, with one year of chemical training, are capable of doing:

Silicon Per Cent		Sulphur by Evolution Per Cent	
	1.95	Check	0.042
Check	1.86	Check	0.045
	1.91		0.045
Check	1.91	Check	0.040
	1.90		0.049
Check	1.90	Check	0.045
	2.39		0.040
Check	2.36	Check	0.036
	2.22		0.049
Check	2.29	Check	0.047
	1.76		0.052
Check	1.71	Check	0.050
	2.31		0.050
Check	2.26	Check	0.047
	1.75		0.071
Check	1.84	Check	0.068

The results obtained for color carbon were fully as good. In titration work the women are able to distinguish the end points with decided ease. This is equally true in matching colors. Their work is characterized by neatness and order. The wages of the women worker range from \$11 to \$15 per week, eight hours per day, five and a half days per week.

The Pacific Foundry, San Francisco, is putting in the foundation of a new steel building, 52 x 245, and a steel lean-to, 22 x 245, at its plant at Eighteenth and Harrison streets. The foundry already has two cupolas, and a third will be built. In addition, a No. 6 Root blower will be installed. A considerable number of minor improvements will be made, bringing the cost to \$100,000. This company is successfully operating a small electric furnace on cast-iron borings, making pig iron.

New Phase in the Steel Supply Problem

(Continued from page 223)

ever, the War Industries Board does not undertake to guarantee to the industry any proportion of its steel requirements.

4. Steel and other war materials may be conserved through the observance by manufacturers, retailers and operators of the strictest supervision of the use of motor trucks, by maintaining and repairing each vehicle for operation as long as possible before replacing it with a new one and by observing other economies which were discussed and will be further developed.

5. The manufacturers and dealers fully realize that steel is today the world's most needed metal and that, in view of the urgent war demands of this nation and the Allies, it is well-nigh treasonable to consume a pound of it that can be saved. With this in view, the manufacturers and dealers pledged themselves to reverse their practices of normal times, and, instead of selling through solicitation as many trucks as possible and furnishing new trucks to replace old ones, to use their utmost endeavor to induce owners and operators to repair and use the trucks they have as long as possible, to operate them fully loaded, and, through shifts of drivers and otherwise, to keep them in use during the greatest possible portion of each day, to the end that each unit will perform a maximum of service and thus reduce proportionally the necessity for building new trucks.

Effort to Prune War Steel Estimates

The statement widely published that the War Industries Board, at the conference with pleasure-car manufacturers, "admitted its inability to furnish figures in support of the statement that the Government will need 20,000,000 tons of steel during the last half of 1918" is wholly misleading. The board has figures which indicate that the requirements will exceed this amount, but neither Mr. Baruch nor Mr. Replogle is satisfied that the estimates have been pruned as much as is possible, and during the past week Mr. Replogle has personally urged the officials in charge of manufacturing and construction in the War and Navy departments, the Shipping Board, and other bureaus to revise their estimates again, especially from the standpoint of dates of delivery. In this connection high Government officials have pointed out that if the delivery dates in the Government schedule can be extended two months it will be equivalent to an increase in steel production of nearly 17 per cent. On an aggregate output of 36,000,000 tons this would mean 6,000,000 tons of steel released for other purposes. Some substantial reductions in estimates have already been made, and there will be a further easing of the situation as the result of redistribution.

Mr. Schwab has kept his promise to have the steel plate schedules of the ship yards carefully revised, and to prevent overloading reservoirs of plates and shapes. Whatever gain has been made in this direction, however, has been more than offset by the astonishing work now being done in some of the ship yards where ships are being built of maximum cargo size at the rate of five per shipway per year. Such performances would not have been regarded as possible a year ago, but Mr. Schwab has succeeded in inspiring the managers of nearly all the yards building steel ships with his own enterprising and indomitable spirit, and the result promises to be a demand for plates and shapes very greatly in excess of the estimates heretofore made.

Increased Plate Capacity

To meet this new development, the War Industries Board is giving renewed attention to the possibility of increasing the capacity of the plate mills. The Steel Corporation and other producers took this matter up several months ago, but in view of the existing situation as to coke, pig iron, transportation, and the necessity for consuming considerable steel in any extension

of existing plate mills, it did not then appear practicable to enlarge this branch of the industry beyond the extension plans already made. Mr. Replogle recently reiterated this view, and while it is understood that further efforts in the way of increasing the facilities for plate production will be made, the Director of Steel Supply does not favor the erection of new plants.

Both Mr. Farrell and Mr. Schwab are said to be optimistic with respect to the outlook for steel ship-building material. The former is quoted as saying that the plans already made to increase the output of plates will result in production considerably in advance of any estimate heretofore given to the public. Mr. Schwab is said to support this view, although there is high authority for the statement that he does not disagree with Mr. Replogle on the proposition that the war needs of the Government will leave but a small surplus of steel for commercial purposes.

Steel for "Trading" with Other Countries

There have been no modifications in the export regulations governing steel to meet the views of certain officials of the War Trade Board who have objected to the recent elimination of the board's authority over export licenses. These members of the board still feel that a certain amount of steel should be available for "trading" purposes, and point to what has recently been accomplished in the way of relieving the strained Mexican situation by allowing small shipments of steel to Mexico under rather severe restrictions as to the use to which it is to be put. Only a small amount of steel is believed to be necessary for what may be styled diplomatic purposes, and this will probably be supplied, although possibly not exactly in the manner desired by the officials of the War Trade Board.

On account of the shortage in the supply of sheet steel and in order to meet increased needs of the Government for other materials, the War Service Committee of the refrigerator manufacturers of the United States during the past week has been in conference with representatives of the War Industries Board to work out a program of conservation and substitution of materials. The committee's report of a plan to eliminate various sizes and styles of refrigerators for the purpose of saving not only materials, but labor and capital as well, will be submitted within a few days to the conservation division of the board.

It is expected that the industry will concentrate production on certain standardized sizes and styles to be agreed upon and eliminate unnecessary styles that consume material the Government requires. This will make it possible to provide the refrigerators that are required for the preservation of food, with the maximum economy of materials. The War Service Committee of the refrigerator manufacturers expressed the desire of the entire industry to comply with the requirements of the Government in its conservation program.

No Priority Certificates on Pig Iron

Mr. Replogle has addressed a letter to all producers and consumers of pig iron eliminated that commodity from the recently issued priority regulations, as follows:

"It has been decided not to issue priority certificates on pig iron, but in the absence of instructions from the Director of Steel Supply to the contrary, producers of pig iron will distribute their product in accordance with the schedule of purposes entitled to preferential treatment, outlined in the War Industries Board reso-

lution of June 6, 1918, shown as Exhibit 'A' in the attached circular. In all other respects procedure as outlined in this circular should be strictly adhered to."

It is understood that the inclusion of pig iron in the

priority circular of the War Industries Board was an inadvertence, as that commodity has been distributed for many weeks under the general direction of the War Industries Board.

W. L. C.

Standardization of Metal Trades Wages

A Conference of Employers and Union Employees with the War Labor Policies Board—Price Fixing Means Wage Fixing

WASHINGTON, July 23.—The War Labor Policies Board throughout the past week has held conferences with representatives of industrial management and of union labor concerning the national standardization of wages. Those present at the conferences have included members of the National Metal Trades Association, the Building Trades Employers' Association, and of the unions in those industries. The representatives of the metal trades included the following:

John W. O'Leary, Arthur J. O'Leary & Son Co., president National Metal Trades Association, Chicago; F. C. Caldwell, H. W. Caldwell Sons Co., Chicago; J. H. Schwacke, William Sellers & Co., Inc., Philadelphia; W. C. Hecks, Curtis & Co. Mfg. Co., St. Louis; A. E. Newton, Reed-Prentiss Co., Worcester, Mass.; W. A. Layman, Wagner Electric Co., St. Louis; H. D. Sharpe, Brown & Sharpe Mfg. Co., Providence; R. O. Wells, attorney Manufacturers Association of Connecticut, Hartford; H. D. Sayre, secretary National Metal Trades Association, Chicago; J. D. Hibbard, commissioner National Metal Trades Association, Chicago; William Asbury, Enterprise Mfg. Co., Philadelphia; Mr. Davis, president St. Louis Employers' Association, St. Louis; H. Brewer, Winchester Repeating Arms Co., New Haven; H. H. Rice, General Motors Co., Detroit; William H. Barr, president National Founders' Association, Buffalo; Miner Chipman, California Metal Trades Association, San Francisco, and F. C. Drew, California Metal Trades Association, San Francisco.

With regard to the methods to be employed in standardizing wage scales for the entire country, Chairman Felix Frankfurter of the War Labor Policies Board has issued the following statement:

Reasons for Wage Standardization

"In seeking standardization the precedents of unionized industry are being followed. Wages have, of course, long been standardized by the agreements of employers and employees in many industries.

"The same kind of standards which the railroad brotherhoods and the railroad managers established in the transportation systems, the same kind of standards which the organized coal miners and the coal operators set up in the well developed coal fields, the same kind of standards which the carpenters, the blacksmiths, the plumbers, the organized tailors created by agreement with their employers, the War Labor Policies Board is, also by mutual consent, negotiating for the entire country.

"Wage standardization merely extends the familiar method of wage fixing to cover the entire nation. What has been done in many industries the War Labor Policies Board is planning for the whole people. But, although wage standardization admittedly follows familiar precedent, it is solely a war measure.

"The President has said that industry plays as essential and as honorable a role in this great struggle as do our military armaments. With that fact in mind, employees and employers have discussed wage standardization with the War Labor Policies Board. Except as a war measure it frankly would not have been considered.

"But the need to stabilize industrial conditions so that no productive power be wasted is so obvious that the representatives of the War and Navy departments and of the Emergency Fleet Corporation, together with the other Governmental branches charged with the duty of supplying the primary materials of war, have, with labor leaders and business executives, become convinced

that wage standardization is essential to national success over Germany.

"The need for increased production of war stuffs through stabilized industrial conditions has, furthermore, long been so apparent that Congress, on its own initiative, without the advice, and even without the knowledge of the War Labor Policies Board, instructed the Policies Board to standardize wages.

"But, although the showing made by Army, Navy and Fleet Corporation was overwhelmingly convincing, the Policies Board would have hesitated to ask labor to make whatever sacrifice wage standardization involves, if the proper safeguards had not been erected. If profiteering had been allowed to go on unchecked, and the cost of living had not been controlled, standardization would not have been right.

"Congress through the taxes on excess profits, the War Industries Board through its price fixing, the President through the veto of \$2.40 wheat, have prepared the way for standardization of wages. Additional methods of keeping down the cost of living are being investigated at this time.

"All these measures, past and pending, have revealed the determination of the American people to let no one make money out of the war. What price fixing means for the manufacturer wage standardization is to the workers of the country.

"That means plainly that just as the price-fixing committee takes into account the cost of production and proper profits, so wage standardization must be built upon an accurate knowledge of the cost of living and a just estimate of what makes up the right American standard.

"Upon these general grounds the War Labor Policies Board is advancing as rapidly as the gravity of the problem permits, to the establishment of standard wages. Every one who has a real interest at stake will be consulted."

In the practical work of fixing wage scales the War Labor Policies Board is having the assistance of Herbert F. Perkins, vice-president International Harvester Co.; John R. Alpine, vice-president American Federation of Labor; and Hugh Frayne, labor representative of the War Industries Board.

Conferees of the Metal Trades

Representatives of the National Industrial Conference Board, meeting in Washington July 17, appointed to represent the metal trades in co-operation with the National War Labor Policies Board the following committee: John W. O'Leary, Chicago; W. A. Layman, St. Louis; Henry D. Sharpe, Providence, R. I.; F. C. Caldwell, St. Louis; M. W. Alexander, Lynn, Mass.; J. H. Schwacke, Philadelphia, temporarily acting for Mr. Alexander in his absence. Similar committees have been appointed by the building trades and organized labor.

Will Enlarge Shipyard

The Great Lakes Engineering Works in Detroit announces that it will more than double its shipbuilding plant at Ashtabula, Ohio. It is stated that over \$1,000,000 will be spent in enlarging the capacity of this yard. The extension work will be started at once in order to provide the increased capacity for building boats for 1919 delivery.

Coke Operators Demand Prohibition

Liquor Believed to Be Responsible for Reducing Coke Production 250,000 Tons Per Month—Vigorous Efforts to Keep the Men at Work Only Partially Successful

UNIONTOWN, PA., July 22.—Officials of the United States Fuel Administration and the leading coal and coke operators in the Connellsville region seek the elimination of intoxicating liquors for the duration of the war. It is estimated that by reason of the prevalence of intoxicating liquors, coke production in the Connellsville region is reduced 250,000 tons per month and that nearly 200,000 additional tons of pig iron could be produced were this production of 250,000 tons of coke per month available.

There is nothing visionary about the views of these officials and operators who were consulted about this important question. They are not dreamers; they are not considering the matter of so-called personal privilege or the moral right or wrong of prohibition insofar as the question right now at issue is concerned.

They are considering means of winning the war by stimulating the mining of coal and the production of coke. They are considering means of greater individual efficiency per man and greater efficiency of the present available man-power in the Connellsville region. They are considering the elimination of all destructive influences which hinder maximum endeavor in the most essential destructive necessity—that of destroying Prussianism.

An increase of 10 per cent to 15 per cent in coke production would result through the elimination of intoxicating liquors, declared R. M. Fry, a member of the Connellsville Regional Fuel Administration Committee, and an admitted authority on labor and production in the Connellsville coking region. This percentage, Mr. Fry continues, means the loss in production of 250,000 tons of coke each month.

Drastic Steps Taken

Drastic steps are being taken these days to increase the coal and coke production. First there was instituted the campaign of education to emphasize upon the mine employes their responsibilities in backing up the American fighting forces in the European battleline. Then followed appeals to the patriotism of the men themselves and finally the most drastic step has come in the promulgation of an order by the United States Fuel Administration demanding that each employe work six days a week and where an employe lays off even a portion of one day without just cause his name, together with other important data, is reported to the Fuel Administration offices at Uniontown and to the Federal headquarters. In addition, his name is publicly posted at his plant.

These appeals have resulted in great good. By no means may it be said that the majority of the employes at the mines are labor slackers or that they fail to appreciate the importance of their work in the war-making machinery of the Government. Fully 70 per cent of the labor works steadily, is thrifty and will be unaffected by the drastic regulations just imposed. But it is the other 30 per cent, the balance of power, so to speak, which is affected by these outside influences—destructive, if you please—which are cutting down the production. And statistics carefully compiled show that the general average for the entire region places the blame for a drop of fuel output of 10 to 15 per cent, and some operators even venture a maximum of 20 per cent—upon intoxicants.

Drunkenness Following Pay Day

Last week was the week immediately following pay day. During the first half of the week, there was a perceptible slump in the regional production. Figures compiled by one leading operator have consistently shown that 15 to 16 per cent of his men were off duty

the Monday or day following pay because of drunkenness or associate ills. This averages a drop to 12 per cent on the second day following distribution of pay and of this number 9 per cent are repeaters who were off the first day. The percentage then dwindles gradually, although the slump continues in gradually diminishing percentage for from four to five days.

Figures submitted by an official of one of the leading independent companies in the Connellsville region virtually bear out the statistics of this other operator. These data show that there is an average of 12 to 21 per cent lay-off of labor, the figures being compiled for each two week period. The best illustration, this official said, was the month of May when the car supply for his mines was virtually 100 per cent. The lay-off for May was 12 per cent. While he did not have the exact figures, he estimated carefully that from two-thirds to three-fourths of the men who laid off did so because of drinking. This resulted, he said, in an average loss in production for his plants of from 12 per cent to 15 per cent. "I don't blame the beer, which nowadays contains such a small percentage of alcohol, nor the light wines, so much as the whiskey which the men obtain."

Social Clubs an Evil

At least two operators with whom the writer talked complained of the so-called social clubs which have sideboards and are scattered in the coke region. Thus, say the operators, the men are able to secure their drinks practically at any hour of the day or night. These clubs are discouraged in so far as possible.

The Connellsville operators contend, too, that should intoxicants be eliminated, the individual efficiency of the men would be increased. Many of the men, they say, drink but not to such an extent as to cause them to lay off, but the drinking impairs their efficiency and cuts down their output.

An official of one of the leading coal companies in West Virginia, who also has mining operations in other states, declares that since prohibition became effective in West Virginia, there has been a marked increase in individual efficiency and in production in the region. "This increased production," said this official, "surely has not been less than 10 per cent and perhaps at least 15 per cent." Figures suggested by him and conditions discussed by him in a brief telephonic conversation tallied with astonishing exactness to the claims set up by the Fayette County operators and he was given no intimation as to the percentages mentioned by the local producers.

Squarely Meeting Situation

The United States Fuel Administration representatives here and the coal and coke operators in the Connellsville region are meeting the labor situation squarely. Their campaign of education, the appeal to patriotism and the imposing of these latest drastic absentee report slips, are all steps toward the goal of maximum production. They declare that, pending prohibition, if war time prohibition is to come, and they believe it will eventually, every step in their power under existing conditions will be taken to better the production.

The operators and fuel administration and the great majority of the labor feel that everything possible under present conditions is being done. It is message after message like the following from National officials, complaining that production is not satisfactory, that brings them face to face, they say, with the absolute necessity of further drastic action, and the majority of them contend that war-time prohibition in some form or another is the answer.

Machinery Markets and News of the Works

MORE MUNITION MAKING

Midvale Expected to Build 12-In. Howitzers

Increase in Browning Gun Output Still Awaits Approval—New Marine Boiler Plants in Market for Cranes

Munition equipment buying holds to the rapid pace of recent weeks without letup. The speed with which deals are closed for complete plant tool requirements is noticeable of late. The Wright-Martin Aircraft Corporation, which has taken the Wasson Piston Ring Co. plant near its New Brunswick, N. J., works, in exchange for the Bosch Magneto factory at Plainfield, N. J., acquired from the Alien Property Custodian, closed for about 700 more machines besides the 600 placed the week previous. The Bullard Engineering Works, Bridgeport, Conn., bought \$250,000 worth to increase its capacity for making field artillery. At Chicago the American Steel & Machinery Co., McCord & Co., and the Wisconsin Gun Co., Milwaukee, Wis., have done more buying.

It is probable that an arrangement will be made by the Government with the Midvale Steel & Ordnance Co. for the construction of an additional shop at its Nicetown Works for the making of 12-in. howitzers. Its previous contract was for 16-in. howitzers.

The Otis Elevator Co., New York, is seeking quotations on 165 machines for making recuperators on gun recoil mechanism at its Yonkers, N. Y., plant. The

Himoff Machine Co., Astoria, N. Y., is in the market for boring and other heavy machinery for turning out gun mounts. Inquiry for 132 24-in. lathes for turning the outside of shells has been put out by the American Car & Foundry Co. at Cincinnati.

The Symington-Chicago Corporation has now taken out building permits covering nearly \$1,000,000 of construction for its new shell plant, for which equipment purchases will eventually total several million dollars.

Makers of Browning guns have taken no steps as yet to increase output, but orders may be placed soon. The plans of the Winchester Repeating Arms Co., New Haven, Conn., for this work, now awaiting approval, provide for \$500,000 worth of new equipment.

The Scullin Steel Co., St. Louis, in connection with the War Department, has awarded contract to the Crowell-Lundoff-Little Co., Cleveland, for the first unit of its new munition plant, a forge shop, 250x400 ft. A working force of several thousand men is contemplated.

Reports from Chicago state that priority orders for standard tools at best can now effect delivery only in normal sequence; otherwise, they are unobtainable.

New crane inquiries have appeared for the following companies who will build marine boiler plants: 19 for the Iroquois Works, Barber Asphalt Paving Co., Buffalo; 17 for the Barber company's Philadelphia branch, and 17 for the Sun Shipbuilding Co., Chester, Pa., all from 10 to 100-ton capacity.

Labor shortage has been eased noticeably at Detroit by a shifting of workers from non-essential industries. Indications are, however, that at points of rapid plant development this transfer of labor does not continuously keep pace with demand.

New York

NEW YORK, July 23.

The Otis Elevator Co., New York, is getting quotations on about 165 machine tools for its Yonkers plant, where recuperators for gun recoil mechanisms will probably be manufactured for the Ordnance Department. The list includes about 90 turret lathes, 24 engine lathes, 15 internal grinders, a few boring mills and a number of other tools.

The outstanding feature of the past week in the New York market was the placing of large orders for tools by the Wright-Martin Aircraft Corporation. It is stated that more than 700 tools were bought. These will be used to increase the production of Hispano-Suiza airplane motors at the Long Island City, N. Y., and New Brunswick, N. J., plants of the corporation. The plant of the Bosch Magneto Co., Plainfield, N. J., which, as recorded last week, was purchased by the Wright-Martin Aircraft Corporation from the Alien Property Custodian, will be occupied by the Wasson Piston Ring Co. The latter company will vacate its plant at New Brunswick, adjoining the Simplex plant of the Wright-Martin corporation, so that the latter will have room to expand without doing a part of its work at Plainfield. Occupancy of the Wasson plant will enable the Wright-Martin corporation to increase the capacity for motor manufacture at New Brunswick considerably.

Machine-tool inquiry, as a whole, shows some falling off, which is a welcome condition to some dealers and factory representatives, whose deliveries have been lengthened by the sales made to the Wright-Martin corporation.

The Bullard Engineering Works, Bridgeport, Conn., last week bought about \$250,000 worth of tools to increase its output of field artillery. No action has yet been taken by the companies making Browning guns toward increasing

their output, but orders may be placed soon. The Winchester Repeating Arms Co., New Haven, Conn., will require about \$500,000 worth of new equipment if its plans are approved. The New England Westinghouse Co., Springfield, Mass., bought about \$25,000 worth of tools last week for balancing up. The American Can Co., Edgewater, N. J., has bought a few tools for shell work.

The Himoff Machine Co., Astoria, Long Island, N. Y., has been getting quotations on boring machines and other large tools for increasing its output of gun mounts. The company is expecting an additional Government contract. The American Radiator Co., Bayonne, N. J., has also got figures on additional equipment for increasing its output of guns.

The Sprague Electric Works, General Electric Co., Bloomfield, N. J., has inquired for 10 large turret lathes.

The Brazilian Mission, New York, is getting quotations on tools for munitions work in Brazil.

The Mobile Shipbuilding Co., Mobile, Ala., which has been building wooden ships, has received a contract for 12-5000-ton steel ships, which will be built at Mobile. A new shipyard will be constructed, for which cranes and machinery will be required. The New York office of the company is at room 1711, 30 Church Street. Bids are now being taken on the fabrication of steel for the ships, but there is a possibility that the company may build its own fabricating shop.

From time to time lots of tools, which were sold for export and never shipped, appear on the market. A New York dealer now has a list of about 200 miscellaneous tools, which are in a New York warehouse. These tools were sold to parties in Russia but never shipped. They will now be disposed of to American manufacturers.

Several new crane inquiries have appeared in the mar-

ket during the past week, the largest coming from the Iroquois Works, Barber Asphalt Paving Co., Buffalo, N. Y., which wants 19 cranes for a new marine boiler shop. A similar inquiry, but for 17 cranes, has been issued by the Barber Asphalt Paving Co. from its Philadelphia office. The cranes wanted range in capacity from 10 to 100 tons. The Sun Shipbuilding Co., Chester, Pa., which will also build a marine boiler shop, is asking for bids on 17 cranes, of 10, 25, 35 and 100-ton capacity. The Watertown Arsenal, Watertown, Mass., is in the market for a 10-ton, 75-ft. span crane. The Standard Oil Co. of New Jersey also wants a 10-ton crane for its Bayway, N. J., plant. The Crucible Steel Co. of America has placed an order with the Pawling & Harnischfeger Co., Milwaukee, Wis., for 25 traveling cranes of 5, 10 and 15-ton capacity, for additions to the company's steel and ordinance plants at Harrison, N. J. The Symington Forge Co., Rochester, N. Y., has ordered two 7½-ton cranes from the Chesapeake Iron Works, Baltimore, Md. The Mead, Morrison Mfg. Co., East Boston, Mass., has ordered a 10-ton crane from the Milwaukee Electric Crane & Mfg. Co., Milwaukee, Wis. The American Car & Foundry Co., New York, has bought five 5-ton cranes for its Western shops from the Toledo Bridge & Crane Co., Toledo, Ohio.

MacArthur Brothers, 120 Broadway, New York, now operating an ammunition loading works at Washington Park, N. J., for the Ordnance Department, will construct six more plants for similar service. The new works will be located at Gibbstown, N. J.; Tullytown, Pa., and at other points in the West. About 2000 employees are now at the Washington Park works, and this number is to be increased to about 3000.

The Barber Asphalt Paving Co., 233 Broadway, New York, has completed negotiations with the Emergency Fleet Corporation for the erection of a plant at Maurer, near Perth Amboy, N. J., on the site of its asphalt plant, for the manufacture of marine boilers. The initial building will be 300 x 500 ft., equipped, it is understood, for a capacity of 200 Scotch type marine boilers per year. The company expects to employ over 500 men.

The International Arms & Fuze Co., Bloomfield, N. J., has had plans prepared for a three-story addition, 75 x 100 ft.

In connection with the construction of a new reservoir for the municipal water plant, the Board of Aldermen, Perth Amboy, N. J., is planning the construction of a high pressure pumping plant with a capacity of 2,000,000 gal. daily, divided into two units of 1,000,000 gal. rating. The plant will be on Carlock Avenue, near Pulaski Street. George A. Johnson, 150 Nassau Street, New York, is consulting engineer.

The International High Speed Steel Co., Rockaway, N. J., is said to be planning an addition to be used as a wire mill.

The Bethlehem Shipbuilding Corporation, Bethlehem, Pa., is planning for two more shipways at its Moore Works, Elizabethport, N. J., to be used for the construction of ocean-going tugs.

Owen A. Rogers, machinist, 150 Bloomfield Avenue, Bloomfield, N. J., has awarded a contract to Moorman Brothers, Bloomfield, for a one-story machine shop at 152 Bloomfield Avenue.

The De Forest Radio Telephone & Telegraph Co., 1391 Sedgwick Avenue, New York, has acquired five adjoining city lots on Commerce Avenue as site for an extension.

The Victory Steamship Co., New York, has been incorporated with a capital of \$75,000 to establish a shipbuilding and repair works. M. C. Sullivan, 109 West 183d Street; B. B. Mead, 1999 Washington Avenue, New York, and M. W. Sametz, 672 Park Place, Brooklyn, are the incorporators.

The Superior Thread Gauge Mfg. Co., Brooklyn, has been incorporated with a capital of \$10,000 by A. Gronich and A. S. Kelson, 200 Broadway.

The Hadden-Messinger Co., New York, has been incorporated with a capital of \$90,000 by J. S. Scheer, W. R. Lippert and R. G. McCann, 40 Leonard Street, to manufacture automatic selling machines.

The Lang Propeller Co. of America, 527 Fifth Avenue, New York, has increased its capital to \$50,000.

The Raymond Engineering Corporation, 305 Lafayette Street, New York, has increased its capital from \$50,000 to \$500,000.

The Ramberg Dry Dock & Repair Co., Brooklyn, has been incorporated with a capital of \$3,000,000 by H. W. Ramberg, F. Schmidt and C. Sendixen, 51 Seventy-fifth Street, Brooklyn.

The Todd Shipyards Corporation, 15 Whitehall Street, New York, is planning to increase the capacity of its shipbuilding plants. The company operates the Robins Dry Dock & Repair Co., Beard Street, and the Tebo Yacht Basin Co., foot of Twenty-fourth Street, Brooklyn; a plant at Hoboken, N. J., and the Dry Dock & Construction Co., Tacoma, Wash. A contract was recently received from the

Emergency Fleet Corporation for 12 7500-ton freighters, which it is understood will be constructed at its Tacoma plant. Its contracts now total over \$75,000,000.

The F. Y. Forbes Metals Co., New York, has been incorporated with a capital of \$5,000 by J. E. R. H. and F. Y. Forbes, 2157 Sixty-seventh Street, Brooklyn, to manufacture metal specialties.

The Townsend Iron Works, pier 2, Erie Basin, Brooklyn, has increased its capital from \$25,000 to \$100,000.

The Weehawken Dry Dock Co., foot of Baldwin Avenue, Weehawken, N. J., has completed plans for a shipbuilding plant at Peekskill, N. Y., to consist of one and two-story buildings, including machine shop, erecting shops, etc.

The Watervliet Tool Co., Albany, N. Y., has been incorporated with a capital of \$10,000 by W. P. and J. H. Spade and W. J. Kattrein, Albany.

The Continental Shipbuilding Corporation, 103 Park Avenue, New York, with works at Yonkers, N. Y., has received a contract from the Emergency Fleet Corporation for a 1500-ton vessel.

The Greenport Ship Co., Greenport, N. Y., has been incorporated with an active capital of \$550,000 by W. T. Thompson, G. J. Low and W. A. Sweet, 45 Cedar Street, New York.

The Adams Laundry Machinery Co., Troy, N. Y., has been incorporated with a capital of \$200,000 by W. F. Seber, F. P. Dolan and J. H. Broderick.

The National Dry Dock Co., Richmond, Staten Island, N. Y., has been organized by E. P. Morse, Jr., formerly connected with the Morse Dry Dock & Repair Co., Brooklyn, E. J. Donegan and associates. The new organization is negotiating for the purchase of the plant of the McAllister Dry Dock & Shipyard Co., Richmond Terrace, West New Brighton. This is provided with a 4000-ton floating drydock and three of smaller size.

The V. V. Lebedjeff Engineering & Supply Corporation, New York, has been incorporated with a capital of \$250,000 to manufacture ammunition, railroad cars, etc. H. Lebedjeff and A. B. White, 175 West Seventy-second Street, New York, and H. A. Runge, 140 Berkeley Place, Brooklyn, are the incorporators.

The Liberty Edge Pressing Machine Co., New York, has been incorporated with a capital of \$50,000 by M. Downey, A. H. Strickland and D. Rifkin, 1842 Seventh Avenue.

The Carver & Nate Co., New York, has been incorporated with a capital of \$10,000 by F. H. Carver, C. D. Landry and E. F. Whittier, 533 Macon Street, Brooklyn, to manufacture hydraulic equipment.

The Champlain Metals Corporation, 165 Broadway, New York, has increased its capital from \$10,000 to \$50,000.

The Bleeker Machine & Tool Corporation, New York, has been incorporated with a nominal capital of \$5,000 by P. T. Reyland, S. and H. Grundfast, 12 Pike Street.

The Auto-Theft Signal Corporation, New York, has been incorporated with a capital of \$50,000 to manufacture locking and signal equipment for automobile service. W. Abramson, 60 Wall Street; B. H. Mautner, 970 Park Avenue, New York, and E. R. Kinkel, 540 Third Avenue, Brooklyn, are the incorporators.

The National Clutch Co., 544 West Twenty-seventh Street, New York, has increased its capital from \$100,000 to \$200,000.

The Lehigh Valley Railroad Co., Jersey City, N. J., has filed plans for a one-story erecting shop at its works on Washington Street.

The Till Machine Works, 425 Hill Street, West Hoboken, N. J., has filed notice of organization to manufacture special machinery and tools. Charles Till, 303 Grand Street, Hoboken, and Otto Mohr, 1024 Willow Avenue, Hoboken, head the company.

The Standard Welding Co., 775 Communipaw Avenue, Jersey City, N. J., has filed notice of organization to operate a welding plant. Harry M. Schrieffer, 16 Atlantic Street, heads the company.

The Autoarc Welding Tool Co., Brooklyn, has been incorporated with a capital of \$1,000,000 by V. D. Borst, S. M. Stockbridge and J. E. Zelenko, 51 Park Row, New York, to manufacture welding equipment.

The Plunkett Shock Absorber Co., Brooklyn, has been incorporated with a capital of \$50,000 by B. B. and W. H. Plunkett, and C. A. Ogren, 1344 Pacific Street.

The foundry to be erected by the Hay Foundry & Iron Works, Newark, N. J., at its plant on Plum Point Lane, will cost \$40,000, instead of \$20,000, as recently announced. It will be one-story, 41 x 343 ft.

The South Brothers Motor Co., Newark, N. J., has filed notice of organization to operate a general machine shop at

1142 Broad Street. John H. Fennelly, 185 Smith Street, heads the company.

The Newark Bearings Co., Newark, N. J., has been incorporated with a capital of \$50,000 by Abbott L. and Saul Werner, Newark, to manufacture automobile bearings, etc.

The Oil Saving Drip Device Co., 335 Fifteenth Avenue, Newark, N. J., has filed notice of organization. Pasqualino Cuginno, 392 Fifteenth Avenue, heads the company.

The Ogden Corporation, Binghamton, N. Y., has been incorporated with a capital of \$100,000 by W. G. Phelps, F. S. Welsh and W. H. Ogden, to manufacture motor vehicle parts.

The Ausable Forks Electric Co., Ausable Forks, N. Y., has been incorporated with a capital of \$25,000 by G. Chahoon, J. Rogers and J. M. Sheffield, Ausable Forks, to establish a local electric power plant.

Buffalo

BUFFALO, July 22.

Construction work has been commenced on the three-story factory, 80 x 275 ft., and power house to be erected at Fillmore Avenue and East Ferry Street, Buffalo, as a branch of the National Lamp Works of the General Electric Co. The cost will be \$180,000, and 90,000 incandescent electric lamps per day will be manufactured at this plant.

The Atlas Steel Castings Co., Elmwood Avenue and the Erie Railroad, Buffalo, has let contract to the Austin Co., Cleveland, for erection of a one-story addition, 60 x 200 ft., to its foundry.

The Sidney Novelty Works, Sidney, N. Y., has completed plans for two factory buildings, each 75 x 275 ft., one-story, to be erected this summer.

A boiler house is to be erected and equipped for the Municipal Hospital of the city of Rochester, on Warrington Road. Plans are in charge of the Health Bureau, James and Gordon streets, N. W.

Albert J. Howard, 790 Ellicott Square Building, Buffalo, has let contract to the J. W. Cowper Co., Fidelity Building, for a steel forging plant at Norfolk and Northumberland avenues and the Lackawanna Railroad. The initial building will be 80 x 100 ft., of steel frame and corrugated iron.

The Oneeta Mills, Utica, N. Y., is building an engine-room addition 40 x 41 ft., to cost \$10,000.

The Municipal Gas Co., Albany, N. Y., will build a brick and steel addition to its boiler house on Trinity Place at a cost of \$5,000.

The Utica Steam & Mohawk Valley Cotton Mills, Utica, N. Y., is building an engine-room addition to cost \$15,000.

Fire July 11 caused a loss of about \$7,000 at the foundry and machine shop of F. E. Parr, 284 Mills Street, Buffalo, now specializing in the manufacture of automobile parts and hardware specialties.

The Curtiss Aeroplane & Motor Corporation, foot of Churchill Street, Buffalo, is planning for a maximum production of 30 aeroplanes per day at its works. The company is now manufacturing training machines and hydroplanes, and production may reach 40 planes daily.

A machinery loss of about \$35,000 was caused at the plant of the Fredonia Preserving Co., East Main Street, Fredonia, N. Y., by fire on July 11. The building loss was about \$15,000, and it is understood that the structure will be immediately rebuilt and equipped.

New England

BOSTON, July 22.

The Abenague Machine Works, Inc., East Haddam, Conn., has been incorporated with authorized capital stock of \$100,000. It will begin business with capital of \$1,000. The incorporators are Coigate Gilbert, Walpole, N. H.; Frederick Angeloch, New York, and Charles A. Voetsch, East Haddam.

The Morgan Spring Co., Worcester, Mass., is asking bids on an addition, 44 x 200 ft., two stories.

The Lundin Steel Casting Co., Boston, Mass., is building an addition, 60 x 100 ft., one story.

The S K F Ball Bearing Co., Hartford, Conn., has awarded a contract to the J. H. Grozier Co. for an addition, 27 x 104 ft., to be used as a shipping room.

The Draper & Hall Co., Middleton, Conn., has awarded to Wells & Wilcox a contract for a machine shop addition, 30 x 50 ft.

The Milford Tool & Engineering Co., Milford, Conn., has been incorporated with authorized capital stock of \$10,000 by Harry G. Thayer and Gustav P. Newman, Milford, and William R. Rippe and Bert Wainwright, New Haven.

The Neptune Hardware Co., Norwalk, Conn., has awarded to William Lawler a contract for a factory, 50 x 75 ft.

The Colt's Patent Fire Arms Co., Hartford, Conn., has awarded a contract to the Ellison Construction Co., Hartford, for an addition, 35 x 82 ft., one story.

The Lapointe Machine Tool Co., Hudson, Mass., has awarded to the J. J. Prindiville Co., Framingham, a contract for an addition, to cost about \$10,000, to be used as an office and drafting room.

The Hart & Hutchinson Co., New Britain, Conn., has awarded a contract to the J. J. Grozier Co., Hartford, for an addition, 80 x 500 ft., one story.

The Fair Harbor Co., New London, Conn., has been incorporated with authorized capital stock of \$50,000 to manufacture patterns. The incorporators are Francis H. Briggs, Noah F. Ball and Morris Lubchansky.

Landers, Frary & Clark, New Britain, Conn., have purchased the plant of the Meriden Cutlery Co., Meriden, Conn., which was incorporated in 1856, is capitalized at \$400,000 and was the first concern in the country to make table cutlery. The new owners will use the plant, which will be enlarged, to manufacture war material and will increase the working force.

The Connecticut Shipping Corporation, New London, Conn., has been incorporated with authorized capital stock of \$200,000 to build and repair ships. It will begin business with a capital of \$50,000. The incorporators are Carl Vretman, Savannah, Ga.; M. L. Gilbert, New York, and Louis Lubchansky, New London.

Philadelphia

PHILADELPHIA, July 22.

The David Lupton Sons Co., Allegheny Avenue and Tulip Street, Philadelphia, manufacturer of steel sash, etc., has completed plans for a one-story addition, 140 x 300 ft.

In connection with additions to its works at Nicetown, the Midvale Steel & Ordnance Co., Widener Building, Philadelphia, is taking bids for a one-story electric power plant, 53 x 120 ft.

The Savage Arms Corporation, Utica, N. Y., will make improvements in the foundry of its works on East Erie Avenue, Philadelphia, recently acquired from the Isaac A. Shepard Co. The work will include crane runways, etc., and will cost about \$14,000.

The Rolle Castings Co., Philadelphia, has been incorporated with a capital of \$25,000 by Wray C. Arnold and Frank J. Riers, Jr.

The new structures to be erected by the Government at the Frankford Arsenal, Philadelphia, will consist of reinforced concrete and brick buildings as follows: Three stories, 60 x 210 ft.; two stories, 36 x 107 ft., and one story, 35 x 145 ft., for small arms, ammunition, magazine, etc. The Ordnance Department has awarded a contract to Charles Gilpin, Harrison Building, for alterations to buildings Nos. 1, 3, 5, 5a and 10 at the Schuylkill Arsenal. The Navy Department has awarded a contract to Thomas Reilly, 1616 West Thompson Street, for an addition to the aircraft factory at League Island Navy Yard, and a contract for a radio tractor building at the same location to Edward Fay & Sons, 2 South Mole Street.

The Belmont Iron Works, Twenty-second Street and Washington Avenue, Philadelphia, has filed plans for a two-story addition to its structural shop, 50 x 60 ft., to cost \$10,000.

The Bessemer Motor Truck Co., Grove City, Pa., has awarded a contract to the Crowell-Lundoff-Little Co., Fifty-second Street and Grays Ferry Road, Philadelphia, for the construction of its proposed works at Holmesburg Junction, near Philadelphia. The structure will be 90 x 442 ft., and cost \$80,000.

Fire July 15 caused a reported loss of \$20,000 at the works of the William & Harvey Rowland Co., Tacony and Lewis streets, Frankford, Philadelphia, manufacturer of steel springs, etc.

H. B. Underwood & Co., 1025 Hamilton Street, Philadelphia, manufacturer of machinery and tools, has acquired the works which was heretofore operated under lease. It was recently incorporated to manufacture automobiles.

In connection with proposed extensions at the municipal water works, the Board of City Commissioners, Trenton, N. J., is planning the installation of pumping machinery, to consist of a 25,000,000 gal. per day centrifugal pumping unit, a 20,000,000 gal. per day low-lift pump generator, a new engine and other machinery. The extension is estimated to cost \$150,000. E. E. Brownell is engineer.

The Woodhouse Chain Works, Third and Schenck streets, Trenton, N. J., has called for bids for its proposed one-story

plant at Edgely, near Bristol, Pa., of brick, 40 x 180 ft. William Woodhouse is president.

The Worthington Pump & Machinery Corporation, Hazleton, Pa., is taking bids for a one-story reinforced-concrete and brick extension, 100 x 200 ft., to cost complete \$250,000, and an electric power plant estimated to cost \$50,000.

The Crown Smelting Co., Chester, Pa., will build a one-story extension to its pattern works, about 16 x 100 ft.

A mine cave-in July 12 at the plant of the Sheldon Axle & Spring Co., Conyngham Avenue, Wilkes-Barre, Pa., manufacturer of automobile springs, axles, etc., destroyed a portion of the automatic department, with loss estimated at \$10,000.

The Grey Iron Casting Co., Mount Joy, Pa., has received a contract from the Government for 1,000,000 metal can openers, delivery to be made in about 90 days.

The Bethlehem Motors Corporation, Allentown, Pa., will build an addition, 100 x 200 ft.

The Badenhause Co., 1425 Chestnut Street, Philadelphia, operating works at Cornwells, Pa., for the manufacture of boilers, etc., is building a one-story machine shop and works, 185 x 350 ft.

The Swett's Steel Co., Government Place, Williamsport, Pa., manufacturer of iron and steel forgings, etc., will build a one-story addition, 50 x 85 ft., to cost \$20,000.

In connection with the proposed reopening of the Holly-wood colliery near Hazleton, Pa., abandoned some years ago, Pardee Brothers & Co., Lattimer Mines, are planning the installation of an electric power plant.

The Titian Metal Co., Bellefonte, Pa., will build a one-story forge shop, 50 x 150 ft.

The Public Service Commission, Harrisburg, Pa., has granted permission to the following electric light and power companies for the issuance of securities to provide for extensions, improvements and general operations: The Metropolitan Edison Co., Reading, \$142,500; the Chester Valley Electric Co., Coatesville, \$80,000; the Pennsylvania Utilities Co., Easton, \$196,000; the Penn Central Light & Power Co., Altoona, \$29,000; the Barnesborough-Spangler Electric Light Co., Philadelphia, \$83,000; the Hamburg Gas & Electric Co., Hamburg, \$50,000.

Baltimore

BALTIMORE, July 22.

The Seaboard Air Line Railway is inquiring for three rocker arm shaping machines and one Niles boring mill, for delivery at Norfolk, Va.

The Rare Metals Reduction Co., 745 Calvert Building, Baltimore, has been incorporated with 1000 shares of common stock, without par value, by Archie M. Frome, Samuel T. Wheatley and Raymond W. Lanpher.

The Baltimore Dry Docks & Shipbuilding Co., Baltimore, will build a two-story air compressor building, 40 x 45 ft., to cost \$3,000.

The Burt Machine Co., 401 East Oliver Street, Baltimore, has been incorporated with \$300,000 capital stock to manufacture canning machinery, etc. The incorporators are John T. and John L. Whitehurst and Edward M. Hammond.

The proposed new works of John T. Lewis & Brothers Co., Baltimore, affiliated with the National Lead Co., for the manufacture of shrapnel, will consist of a main building, one story, 100 x 300 ft., and smaller structures. A site of five acres has been acquired on Columbia Avenue, fronting on the Baltimore & Ohio Railroad, for the plant. It is understood that the output will be used by the Bartlett-Hayward Co. at its local works.

The Ordnance Department, Washington, has completed plans for new works at the Edgewood Arsenal, Edgewood, Md., to cost about \$5,000,000 complete. It will be used for assembling, testing, repairs, etc., and will consist of 10 buildings, averaging 100 x 200 ft. The Austin Co., Bulletin Building, Philadelphia, has received a contract for part of the erection work.

The Fabricated Ship Corporation, Richmond, Va., has been incorporated with a capital of \$1,000,000 by C. P. Royster, A. L. Langley, and R. G. Dashiell, Richmond, to build steel vessels.

The Navy Department, Washington, is having plans prepared for an electric power plant at Annapolis, to cost \$300,000.

The War Department, Washington, has acquired a site on the Potomac River, near Cumberland, Md., for a cellulose manufacturing plant. The initial works is estimated to cost about \$5,000,000 equipped.

The Missouri Valley Bridge & Iron Co., Quantico, Va.,

has received a contract from the Government for building seven vessels.

The Anclote Shipbuilding Co., Tarpon Springs, Fla., is planning a new shipbuildings works on the Anclote River. The company was recently organized to specialize in the construction of schooners.

The Electric Products Corporation, Richmond, Va., has been incorporated with a capital of \$150,000 by O. S. Lindeman and Harold S. Bloomberg, to manufacture electrical goods.

Fire July 16 caused by an explosion, destroyed the nitrate works of the American Agricultural Chemical Co., near Jacksonville, Fla., with loss reported at \$1,000,000.

Chicago

CHICAGO, July 22.

Two or three large deals have been closed the past week, and in every direction business in machine tools and shop equipment is proceeding under pressure. The New York Central has closed against its large list for delivery to its shops, and some of the business came to this district, although the purchasing was done at Cleveland. The great demand is directly the result of war work, the bulk being due to increased production of going plants. A Wisconsin tractor company has obtained additional orders, amounting to an immense figure, and has been in the market.

The American Steel & Machinery Co., Pullman, Ill., has placed orders here for tool-room equipment, although the greater part of its buying was done in the East. The Wisconsin Gun Co., Milwaukee, also placed some additional business here. McCord & Co., West Pullman, have a shell contract, it is understood for casings, and have been in the market.

The Chicago, Rock Island & Pacific recently issued a list which was repeatedly pruned by the Government and then pigeon-holed, at least temporarily.

Standard tools are exceedingly hard to obtain, even priority orders having to take regular deliveries; without priority, machines are unobtainable. Where munitions work, also trucks and tractors, are concerned, a phase of the market is the speed with which deals are closed. Buyers have come to know that they cannot leave their inquiries pending. If they do, the machinery goes elsewhere.

The Government has taken out permits for buildings to cost \$995,000, which are to house the shell plant of the Symington-Chicago Corporation, their location being between Seventy-fourth and Seventy-fifth streets and Ashland and Robey avenues, Chicago. It is expected that the plant will be completed and in operation at the end of the year. The Thompson-Starrett Co. has the general contract. The cost of equipping the plant will run into several million dollars. As heretofore stated, the greater part of the equipment has been ordered in the East. Meanwhile there is great activity in land deals in the vicinity, and it is probable that many buildings will be erected to house the workers, of whom there will be at least 5000.

Bids are being taken on a two-story manufacturing building, 80 x 380 ft., to be erected in connection with the Corwith plant of the Crane Co., Kedzie Avenue and Forty-first Street, Chicago. The building will cost about \$400,000. The Crane Co. now has about \$5,000,000 invested in buildings at this plant. It furnished the sanitary equipment for the cantonments, and has much other Government business in hand.

Contracts are being awarded for two one-story factory buildings, 69 x 150 ft. and 83.7 x 141 ft., at 136th Street and Brandon Avenue, Hagevisch, Ill., for the Western Steel Car & Foundry Co. They will be of brick and steel and cost about \$40,000. The company recently completed a foundry at a cost of \$60,000.

Libby, McNeill & Libby, packers, Union Stock Yards, have taken bids on an extension, 62 x 150 ft., to a can factory at Blue Island, Ill. It is an addition to a new plant.

G. F. Blakeslee & Co., 2356 Quinn Street, Chicago, have let the contract for a one-story factory, 110 x 337 ft., Fifty-second Avenue and Nineteenth Street, Cicero, Ill., to be used in the manufacture of dish-washing machines. It will cost \$50,000.

Contracts have been awarded for alterations and a seven-story addition, 75 x 108 ft., to the manufacturing plant at West Twenty-fifth and Dearborn streets, occupied by Bauer & Black, chemists, 45 West Twenty-fifth Street, Chicago.

The Union Drawn Steel Co., Gary, Ind., has filed plans for a one-story boiler house, 52 x 84 ft., to cost \$5,000, which will enable the company to furnish its own power.

The Multix Motors Companies, Inc., Chicago, has been incorporated in Delaware with capital of \$1,000,000 to man-

ufacture motors, engines, etc. Samuel C. Wood and A. D. Suess, Chicago, are the incorporators.

The Atchison, Topeka & Santa Fe Railroad Co., Chicago, has completed plans for the construction of a new one-story power plant, 100 x 100 ft., at Shopton, Ill.

The Monmouth Plow Co., Monmouth, Ill., is planning for the erection of a five-story building, 60 x 90 ft., with power plant, to cost about \$40,000.

The American Steel Foundries, Chicago, has broken ground for a two-story addition to its pattern works at East St. Louis, Ill., to cost about \$10,000.

The Acme Steel Goods Co., Archer Avenue, Chicago, has awarded a contract to the Morgan Construction Co., Worcester, Mass., for the erection of a one-story plant, 80 x 100 ft., on 130th Street, to cost \$100,000.

The Gary Motor Truck Co., Gary, Ind., has increased its capital and is planning the enlargement of its factory to increase production from 500 to 1500 trucks per year.

L. R. Nelson, Peoria, Ill., manufacturer of hardware specialties, has purchased a factory containing 14,000 sq. ft. at Washington and Edmond streets, in that city, and is making plans for its remodeling and enlargement.

The Haynes Stellite Co., Kokomo, Ind., has let contracts for the construction of two buildings each 60 x 132 ft. on ground recently purchased. One of the buildings will house a machine shop and the other a foundry, their cost being about \$30,000.

Milwaukee

MILWAUKEE, July 22.

The conversion of many metal-working shops in the Middle West for the manufacture of munitions and other classes of war material for the Government is furnishing a constantly broadening demand for machine-tools. Local tool builders report that the steady stream of single tool and small-lot orders which has characterized business for two or three months continues. Milling machine demand is especially strong and urgent, and the requirements of Wisconsin manufacturers alone are the heaviest ever known. Conversion to strictly war work is beginning to assume proportions, and tool builders look forward to a maintenance of the demand for some time.

Complaint is heard everywhere that the exhaustion of the supply of skilled labor, coupled with an unusually heavy turnover, is making it extremely difficult for machine-tool shops to maintain the pace they set for themselves by enlarging plants in the last six or eight months. A moderate amount of unskilled labor is available, due partly to the work or fight order, but employers find scant consolation in this situation, as it requires time to make a competent machinist out of raw material. Apprenticeships are being encouraged, but the urgent need is for skilled hands. This condition has never been so serious.

The Mid-West Shipbuilding Corporation, DePere, Wis., has been incorporated with a capital stock of \$100,000 and plans to build ships for the Government on the Fox River at DePere. The incorporators include E. G. Mohr, John A. Littell and W. W. Callahl. Detailed announcement of the company's program will be made later.

The John Obenberger Forge Co., Milwaukee, has engaged Klug & Smith, consulting engineers, to design and erect a brick and steel drop forge plant addition, 80 x 180 ft., costing about \$65,000, with hammer and other equipment. The plant is located at Fifty-third Avenue and Burnham Street, and was erected about a year ago. John Obenberger is general manager.

The Highway Trailer Co., Edgerton, Wis., will build a 250-ft. brick extension, 30 ft. wide, costing about \$15,000, to provide facilities to fill Government contracts for airplanes and ordnance trailers. James W. Menhall is general manager.

The John M. Graef Mfg. Co., Menasha, Wis., has engaged E. E. Wettengill, architect, Appleton, Wis., to prepare plans for its new plant for the manufacture of paper mill screen looms to be located at Appleton Junction. The machine-shop will be 110 x 150 ft., one-story; the boiler room, 30 x 40 ft., and the warehouse, 40 x 100 ft., two stories. It will cost about \$75,000 with equipment. John M. Graef is general manager.

The Wetmore Mechanical Laboratory Co., 605 Enterprise Building, Milwaukee, has increased its capital stock from \$25,000 to \$50,000. Charles P. Wetmore, M. E., is president.

The Board of Public Works, Manitowoc, Wis., is taking bids until 4 p. m., Aug. 5, for a 1500-kw. turbo-generator unit; one 300-hp. vertical water tube boiler and underfeed mechanical stoking equipment.

The Badger Foundry Co., 1835 Holborn Street, Racine, Wis., has increased its capital stock from \$30,000 to \$100,000 to accommodate the growth of its business. C. J. Hanson is secretary and treasurer.

The Janesville Machine Co., Janesville, Wis., which recently was reorganized and the capital stock increased from \$750,000 to \$2,250,000, when the control passed to the General Motors Corporation, has elected the following officers: President, J. A. Craig; vice-president, H. L. Barton, Detroit; secretary and treasurer, T. S. Merrill, Detroit. Mr. Craig was general manager of the company under the previous ownership. A tractor manufacturing plant will be erected on a 125-acre site in Janesville. The present farm machinery and implement plant will be enlarged for the manufacture of machinery in combination with the tractors. A new 350-hp. boiler will be installed at once.

The Coddington Engineering Co., North Milwaukee, general industrial contractor, has increased its capital stock from \$75,000 to \$100,000. Samuel C. Coddington is president and general manager.

The Evinrude Motor Co., 279-281 Walker Street, Milwaukee, manufacturer of detachable rowboat motors and other small gas engines, is converting from 75 to 85 per cent of its capacity for the purpose of handling Government contracts for hand and rifle grenades. The production of motors is being limited to about 10 per cent of its normal output. P. M. Tallon is secretary.

The Litnum Bronze Co., a division of the Ampco Rolling Mills Corporation, 408 Security Building, Milwaukee, which recently acquired the former plant of the Laursen Hydraulic Pump Co., Menomonie, Wis., expects to be producing billets of Litnum metal in quantity within 30 days. A moderate output of Litnum welding rods for oxy-acetylene welding has been reached. The company is building most of its own machinery and will specialize in wire and tube stock. E. M. McVicker, Milwaukee, is president.

The International Steel Products Co., manufacturer of mufflers and other stamped metal parts for motor vehicles, is reported planning to build a new factory in Milwaukee. The company is capitalized at \$150,000. Further information is not yet available.

The LaCrosse Tractor Co., LaCrosse, Wis., which recently increased its capital stock to \$2,500,000, is completing improvements and extensions that will increase its output to 25 tractors a day by Aug. 15. The company controls a number of iron and steel foundries in LaCrosse, which now are melting 40 tons daily in the aggregate. A tract of 25 acres has been acquired for future extensions, to be made as needed. B. F. Haney is general manager.

Detroit

DETROIT, July 22.

The machine-tool market remains about normal with large orders for munition work counteracting the scarcity of miscellaneous and small orders. Delivery on several classes of machines have improved, grinders being obtainable within 30 or 40 days, milling machines from 30 to 60 days. Large lathes in demand for shipbuilding work are difficult to obtain and require from three to four months.

Manufacturers are impressed by the lack of coal, not so much for the plants as for the homes. They declare that unless fuel begins to arrive soon the majority of homes will be cold next winter, and because of this production will be greatly curtailed.

Little effect is expected in Detroit of the further reduction of automobile manufacture by the War Industries Board. Almost without exception local automobile companies and most of them throughout the State are largely engaged on war orders. It is estimated that not 25 per cent normal production of automobiles is being made today in Michigan.

The labor situation is not so acute, due largely to the gradual decrease in production of nonessentials which is releasing men for war industries. The shortage still is about 20,000 to 25,000.

The W. J. Brinen Lumber Co., Muskegon, Mich., has purchased from C. D. Stevens of the Muskegon Boiler Works, the site and buildings of the latter company's plant.

The truck of the Paige-Detroit Motor Car Co. is to be a quad type machine, driving on all four wheels, and will be built in the heavier models. The company will manufacture several for the Government, and will start building for the general market this month.

The General Motors Corporation will erect body and assembling factories in St. Louis. A site of 105 acres has been purchased and construction will begin at once.

The Maxwell Motor Co. has been awarded an additional \$40,000,000 Government contract for shells, bringing the company's total war business to \$75,000,000. The Govern-

ment is preparing to finance the company by building a \$1,000,000 addition to enable it to handle the new work. The new contract involves the machining of an enormous quantity of 12-in. shells.

The new plant of the Lapeer Tractor-Truck Co., Lapeer, Mich., has been completed. Machinery is being installed, and it is expected that manufacture of the new tractor-truck will begin within two weeks. The company is capitalized at \$100,000. The officers are: W. H. Tucker, president; C. W. Smith, vice-president; E. E. Mix, secretary; R. T. Carpenter, treasurer. These officers and George H. Churchill, P. A. Snowman, S. B. Winn, Frank Thompson and Capt. E. T. White comprise the board of directors.

A. A. Fisher, president and general manager of the Standard Motor Truck Co., Detroit, has received from Washington notification that the 2-ton and 3½-ton Standard truck has been adopted by the general supply committee for use in the post office department, and that orders will be placed for a large number.

The C. R. Wilson Body Co., Bay City, Mich., is about ready to start the production of airplanes for the Government, and is advertising for skilled men.

The plant of H. Brewer & Co., founders, Tecumseh, Mich., will be doubled. The company recently received a Government contract and has been working to full capacity. At the annual meeting the following officers were elected: P. W. A. Fitzsimmons, president; William F. McGlashen, first vice-president; D. J. Carson, second vice-president; J. D. Shull, secretary-treasurer; Charles Burrledge, resident manager. George N. Stanley, formerly with the American Car & Foundry Co., Lancaster, N. Y., has been appointed works manager.

The Perry Boat Building Works, Pearl Beach, Mich., recently received a Government order for 126 of the United States regulation life boats and work boats.

George D. Grant, president of the Marx Brass Works, Detroit, and of the Grant Motor Car Co., Cleveland, has been elected president of the Kerosene Equipment Co., Detroit. J. W. Racklyoft is vice-president; E. E. Schwartzkopf, treasurer and general manager, and R. J. Sherman, secretary. The concern makes a kerosene carburetor for Ford cars.

The Kalamazoo Carton Co., Kalamazoo, Mich., has increased its capital stock from \$125,000 to \$200,000, and changed its name to the Sutherland Paper Co.

Through a recent decision of the Ordnance Department, the caterpillar tractors being built at the Reo Motor Car plant, Lansing, Mich., and at the Maxwell Motor factory, Detroit, will be armored in these plants instead of being finished elsewhere. The armor is said to be less than ¼ in. thick, but is so tough that the ordinary machine gun or infantry rifle has no effect upon it.

The Harroun Motor Corporation, Wayne, Mich., has recently completed the first of four plants being erected to constitute the shell manufacturing section, and 300 men are now employed. It is expected that the new plant, when completed, will employ nearly 1000 men.

The Wolverine Tractor Co. shipped its materials and machinery from its former plant at Inkster near Detroit on July 17 to its new plant at Saginaw, Mich., where it plans to begin production within 60 days. W. E. Wagenhals is vice-president and engineer.

The Murphy Iron Works, Detroit, in addition to its regular line of automatic furnaces, has taken over the manufacture of a large number of Riley stokers for the Sanford Riley Stoker Co., Worcester, Mass., and has just completed a new building, 66 x 172 ft., equipped with a 7½-ton crane for this particular work. F. B. Bigelow is treasurer and general manager.

Plans have been filed by the General Aluminum & Brass Casting Co., Detroit, for its new plant on St. Aubin Street and East Grand Boulevard, to be one-story, of steel and reinforced-concrete, 35 x 101 ft., and cost about \$25,000.

The American Blower Co., Russell Street, Detroit, is planning for the erection of a one-story extension to its works, 50 x 175 ft., on Harper Avenue.

The Motors Metal Mfg. Co., Detroit, has taken bids for the construction of a new one-story factory, about 65 x 220 ft., on Milford Place.

Building permits have been granted to the American Car & Foundry Co., Detroit, which will mean an outlay for construction of about \$37,000. The structure to be erected consists of two one-story buildings, 60 x 100 ft., and 60 x 72 ft. respectively.

Cleveland

CLEVELAND, July 22.

Machinery houses report a very active demand for single machines and small lots of tools covering requirements of plants doing various kinds of Government work, but no inquiries for lots larger than a half-dozen machines developed during the week. The demand for turret lathes is very heavy. A local builder has taken 16 turret lathes for the Alameda, Cal., plant of the Bethlehem Shipbuilding Corporation, and a round lot of turret lathes by the Wright-Martin Aircraft Corporation, also went to a Cleveland manufacturer. There are good inquiries for automatic machines in lots up to a dozen. The Eastern inquiry for several round lots of automatic machines is still pending, the Government orders for shell work for which the machines will be required not yet having been placed. The Government orders for locomotive cranes for France are still pending.

The Wellman-Seaver-Morgan Co., Cleveland, has taken a contract for a 200-ton revolving hammer head crane for the New York Shipbuilding Corporation. It will be used for fitting-out work.

The Brown Hoisting Machinery Co., Cleveland, has taken an order from the Diamond Alkali Co. for a large bridge crane to be erected at Fairport, Ohio, for handling coal and lime stone. It will have a 191 ft. span and total length of 316 ft.

The Electric Products Co., Cleveland, will erect a one-story factory, 90 x 176 ft., at 1723 Clarkstone Road.

The International Steel Tie Co., 16702 Waterloo Road, Cleveland, will build a one-story machine shop 52 ft. x 120 ft.

The American Steel Tube Co., Toledo, Ohio, has taken a large contract for the manufacture of steel tubes for the Government and has acquired the Landers Brothers plant, consisting of a two-acre site and two buildings. New equipment will be added and the plant enlarged.

The American Welding & Mfg. Co., Warren, Ohio, has placed a contract for a one-story factory, 100 x 260 ft.

The Trumbull Division of the National Lamp Co., Warren, Ohio, has placed a contract for the erection of a factory, 83 x 140 ft.

The National Grave Vault Co., Gallon, Ohio, has taken a Government contract for the manufacture of parts for field kitchens.

The Timken Roller Bearing Co., Canton, Ohio, will erect a new steel building about 90 x 200 ft. for storage purposes, to be equipped with an electric traveling crane. The contract has been placed with the Canton Bridge Co.

The United States Ordnance Department has established an office in the Renkert Building, Canton, Ohio, to look after production work in that city. It is in charge of Capt. H. R. Schwartzberg.

The C. & G. Cooper Co. and the Chapman Engineering Co., Mount Vernon, Ohio, will erect a joint two-story brick and concrete building, 93 x 93 ft., for office purposes and drafting room. The contract has been awarded to Cullen & Vaughan, Columbus, Ohio.

The Pennsylvania Lines West of Pittsburgh, Pittsburgh, has been granted permission by the Railroad Administration to build a new locomotive repair shop and engine house at Stark, Ohio, to cost about \$900,000 and to remodel and improve its shops and engine house at Wellsville, Ohio, at a cost of \$276,000.

Cincinnati

CINCINNATI, July 22.

The American Car & Foundry Co. has issued an inquiry for 132 24-in. lathes for turning the outside of shells. The same company recently placed an order with the Niles Tool Works Co., Hamilton, Ohio, for 150 heavy car-axle type lathes, designed with special features for turning large projectiles for the Government.

It is generally reported that the Government has given machine-tool builders a broad hint that priority orders will be issued promptly for everything needed in the construction of machine tools that are intended for plants engaged in war work. This policy of the Government, if carried out as indicated, places the machine-tool builder on the honor roll and trusts him to see that production is speeded up and that no machines are shipped to plants not engaged in strictly essential work. As some of the smaller machine tools are not much needed by firms engaged in war work some curtailment in a few shops may take place later on.

The labor situation is unchanged with the exception of the return of the striking union patternmakers. These men

resume their work on the former basis of 70c. per hr., with a 52-hr. week.

The Monarch Machine Tool Co., Sidney, Ohio, has completed a one-story addition, 65 x 200 ft., to be used in building 18-in. to 30-in. lathes. Four Champion cranes will be installed.

The Cincinnati Pulley Machinery Co., Covington, Ky., is moving equipment into an addition recently completed. Practically all equipment has been bought.

R. A. Jones & Co., Covington, Ky., are in the market for a 24 x 24-in. planing machine.

Later information shows that the new tractor plant of Henry Ford & Son, Inc., to be erected at Hamilton, Ohio, will be operated by hydroelectric power. The company has purchased the stock of the Hamilton & Rossville Hydraulic Co., and a five-acre site on the Baltimore & Ohio Railroad, on which will be erected a power plant of 3000-kw. capacity. Full details as to the sizes of the buildings are not yet available.

The Hamilton Foundry & Machine Co., Hamilton, Ohio, will make an addition to its plant estimated to cost \$5,000.

The Black & Clawson Co., Hamilton, Ohio, will make additions to its carpenter and blacksmith shops.

The Mosler Safe Co., Hamilton, Ohio, now mostly engaged in war work, will make a small extension to its plant.

The Duriron Castings Co., Dayton, Ohio, has secured permit for an addition, estimated to cost \$8,000.

The Columbus Railway, Power & Light Co., Columbus, Ohio, is considering extensive additions to its power plant.

The Sidney Tool Co., Sidney, Ohio, maker of lathes, has changed its name to the Sidney Machine Tool Co. It has just completed a building 60 x 130 ft., one story, which will be used for assembling. Ground is also being broken for a boiler room to supply the plant with steam heat.

The American Valve & Meter Co., Cincinnati, will erect a one-story addition on Spring Grove Avenue, 35 x 110 ft., of brick and reinforced concrete.

Work has been commenced on the foundations for the plant of the Trailmobile Co., Cincinnati, located in Oakley.

The United States Can Co., Norwood, Ohio, will make an addition to its plant, 40 x 75 ft., one story, of brick.

The Cincinnati Grinder Co., Cincinnati, will build an addition to its plant. A. C. Hoefingheff is president.

The Corcoran Mfg. Co., Cincinnati, which recently purchased the plant of the Knabe Brothers Co., Norwood, is having the buildings remodeled and will remove its metal-working plant there from Winton Place.

The Central South

LOUISVILLE, July 22.

It is reported that Government orders for boilers, pumps and similar equipment will keep local plans busy for several months. With this exception few orders are being received.

With a capital stock of \$50,000 the Buzz Engineering Co., Louisville, has been incorporated by Davis Brown, J. T. S. Brown, Jr., John Ulrich, Alvin and Walter Zoeller. It will manufacture conveying and elevating machinery, pumps, well drills, oil machinery, etc.

Michael Wieder, Louisville, operating a machine shop on Logan Street, has let contracts to Leitchfield & Metzner for a frame addition.

The Visible Measure Gasoline Dispenser Co. of America, Louisville, has purchased for \$13,000 a plant at 714-716 West Breckinridge Street, which it will operate as a manufacturing and assembling plant for gasoline measuring devices and pumps. The pump is the invention of J. H. Brady, one of the officers. J. P. Dant, Sr., is president; Richard Wheatly, vice-president, and J. P. Dant, secretary-treasurer.

The Roy C. Whayne Co., Louisville, machinery dealer, is asking for prices on gasoline-driven locomotives capable of pulling one or more passenger trailers on standard gage track.

Charles T. Lehman, Birmingham, Ala., is in the market for two 9 x 10 in. or 10 x 12 in. hoisting engines, complete with boiler and double winch heads.

The Illinois Central Railroad, Chicago, has completed plans for the construction of a one-story machine shop, 40 x 150 ft., power house, engine house and other buildings at Central City, Ky.

The Superior Welding Co., Louisville, has been incorporated with a capital of \$25,000 by William Ritter, George G. Montz and E. C. Stoecker.

The Sherrill-Russell Lumber Co., Paducah, Ky., is planning to increase its capacity by the installation of new ma-

chinery. Its capital was recently increased from \$75,000 to \$150,000.

The Mobile Shipbuilding Co., Mobile, Ala., recently reorganized with a capital of \$1,000,000, has received a Government contract for 12 steel freighters, each of about 5000 tons capacity. It is planning for the construction of a new fabricating shop with monthly output of over 3000 tons, and a new forge shop and flanging works. Frank McLaughlin is general manager.

The Capital Grist Separator Co., Columbia, S. C., has been incorporated with a capital of \$10,000 to manufacture grist mill machinery. G. B. Bundrick and B. Kirkland, Columbia, are the incorporators.

St. Louis

ST. LOUIS, July 22.

The city of Bevier, Mo., is planning the installation of an electric generating plant.

The Springfield Gas & Electric Co., Springfield, Mo., will equip a power plant of 10,000 hp. and install a steam turbine and other machinery.

The Hays Wood Products Co., Jefferson City, Mo., will equip an electric light and power plant for individual use requiring about \$20,000 worth of machinery.

The Johnson Co., Texarkana, Ark., has been organized with a capital of \$50,000 by James A. Johnson and others for the manufacture of cotton chopping machinery.

The McDonald Engineering Co., St. Louis, will equip a \$1,500,000 plant for the manufacture of naval guns and shells. It is a subsidiary of the Moon Motor Car Co.

The Union Saw Mill Co., Hutting, Ark., will rebuild its plant, recently burned, requiring about \$40,000 worth of machinery.

The New Carolyn Metal Co., Joplin, Mo., has purchased the Neosho Granby Metal Co.'s plant and will erect a 300-ton mill, requiring crushers, compressors, engines, boilers, etc.

The Commonwealth Zinc & Lead Co., Miami, Okla., will re-equip its burned plant at a cost of about \$100,000, requiring boilers, engines, conveyors, crushers, etc.

The Doullut & Williams Shipbuilding Co., New Orleans, La., will equip a first unit to cost \$300,000 to build steel vessels. The plant will be tripled as quickly as material and machinery can be obtained.

The James W. Black Co., Plaquemine, La., will equip an 8-way plant for building concrete barges and other vessels. A sawmill to cut forms, concrete mixers and other machinery will be needed.

The Boston-Arkansas Mining Co., Okmulgee, Okla., Parkinson Building, is in the market for friction clutch and transmission equipment, belt-driven air compressors, electric generators, pumping machinery, etc.

The Tru-Lock Ice Co., El Reno, Okla., is in the market for machinery for crushing coal and forcing it into fire boxes by air pressure.

The Killark Electric Mfg. Co., Twenty-second Street and Washington Avenue, St. Louis, is in the market for lathes and punch presses to be installed in the factory under construction at 3940-3948 Easton Avenue. Louis Desloge is manager.

The Smith-Davis Mfg. Co., 1913 Locust Street, St. Louis, is spending \$4,000 to repair the damage done to its bed factory by fire recently and is adding some equipment to its foundry.

The Inland Machine Works, 1500 North Broadway, St. Louis, will come into the market soon for lathes, cutting machines and other tools for the manufacture of piston rings, to be installed in a \$100,000 factory to be erected on a 10-acre tract in northwest St. Louis. The company, which has Government contracts, is having plans drawn for a four-story plant, 75 x 400 ft. O. G. Stark, general manager, is in charge of extension plans.

The assets of the Missouri Plate Glass Co., bankrupt, whose plant is at Valley Park, Mo., near St. Louis, which included a considerable amount of machinery and metals, has been ordered sold at auction.

The planing mill of the Kettle River Creosoting Works, Madison, Ill., across the river from St. Louis, was destroyed by fire July 16, with a loss estimated at \$50,000. Considerable machinery and dynamos will have to be replaced.

The Delta Shipbuilding Co., Metropolitan Bank Building, New Orleans, has acquired about 40 acres for new shipbuilding works. R. B. Sanford is president.

The Slidell Dry Dock & Shipbuilding Corporation, Slidell, La., recently organized, has acquired property for the construction of a plant to build steel vessels. A. D. Canulette is general manager.

The new munition works to be constructed by the Scullin Steel Co., St. Louis, will consist of a number of reinforced concrete structures to cost, with equipment and machinery, about \$1,500,000. The plant will be erected in connection with the War Department and is understood will give employment to several thousand men.

A two-story, foundry 70 x 110 ft., to cost \$25,000, will be constructed by Henry E. Mueller, St. Louis. Kresse & Ernest, Victoria Building, are architects.

The McDonald Engineering Co., St. Louis, affiliated with the Moon Motor Car Co., has awarded a contract to the Grieve Construction Co., Century Building, for the construction of the initial buildings for its new plant for the manufacture of shells. The structures will include a four-story, reinforced-concrete building, 40 x 125 ft., with extension, 60 x 66 ft., to cost about \$49,000, and a one-story, reinforced-concrete shop, 50 x 70 ft., to be used as a heat treatment plant.

Texas

AUSTIN, July 20.

The Universal Tire & Rubber Association, Houston, has awarded contract for the construction of the first unit of its proposed plant to A. Guidera. The contract calls for the completion of the building within 100 days.

George D. Anderson, Beaumont, has purchased 672 acres bordering the Neches River, near Port Neches, which he will use as a site for a large oil refinery. It is stated that the construction will start as soon as the land can be cleared and the necessary materials assembled.

G. A. Alonzo, president Gulf Shipbuilding Co., Houston, announces that negotiations have been finished for the construction of several steel oil barges. Each vessel will have a carrying capacity of 30,000 bbl.

The Williams Mill Mfg. Co., Texarkana, is constructing a plant for the manufacture of farm implements.

The Glenn Broom Mfg. Co., El Paso, has increased its capital stock from \$10,000 to \$30,000. It will install new machinery and enlarge the capacity of its plant.

H. F. Koespel, Seguin, will install an irrigation pumping plant on the Guadalupe River near that place.

Henry Seligman, Seguin, will construct an irrigation system and install a pumping plant to water 150 acres.

W. D. Allen, Miles, and associates will construct a dam across the Concho River for the purpose of storing water to irrigate 375 acres. The project involves the installation of a large pumping plant.

R. F. Young, Georgetown, will install an irrigation pumping plant on Berry Creek.

The City Council, Lubbock, will soon award contract for constructing a municipal electric light and power plant, \$25,000 in bonds having been issued for the purpose.

The Pacific Northwest

SEATTLE, July 15.

A recent survey of the shipbuilding industry in the Portland district shows that about 40,000 men are working in shipyards and that at least 5000 additional will be employed. Extensions to several plants are contemplated and announcement of a new yard to employ 7000 men is expected shortly. This district has contracts totaling \$200,000,000, covering 59 steel vessels and 98 wooden ships.

The demand for farming implements and land clearing machinery is said to surpass all records, having more than doubled within a year. Several dealers have orders booked for one and two years.

West Coast mills have been advised that orders for 45,000,000 ft. of Douglas fir lumber for use in Daugherty type of ships will be placed with the mills of Oregon and Washington in the near future. It is also stated that contracts for large orders for Navy and Government demands will be forthcoming shortly.

The Western Cooperage Co.'s plant, St. Johns, Ore., was damaged in a recent fire to the extent of \$30,000. A large part of the machinery was burned.

The Great Northern Concrete Shipbuilding Co., Vancouver, Wash., has started preliminary work on its ways. It has contracts for five Government vessels.

The Clover Creek Lumber Co.'s plant, Salsich Junction, near Tacoma, Wash., was completely destroyed in a recent fire with a loss of \$35,000. Walker Foster, Tacoma, principal owner, states the plant will be rebuilt immediately.

The Special Foundry & Machine Works Co., Portland, recently incorporated, has taken over a building which it is converting into a machine shop and foundry. Electric motors will be installed and a cupola for melting iron with capacity of 5 tons per hr.; also a brass, bronze and alloy furnace

with capacity of 500 lb. E. G. Clark is president and W. E. Ramsey vice-president.

The Gulowsen-Grei Engine Co., Seattle, is progressing rapidly with its new plant on Salmon Bay to cost \$300,000. The pattern shop, 30 x 60 ft., is completed, and work on the foundry and main machinery building is being pushed.

The Miami Corporation, Wilmington, Del., plans construction of a new lumber mill at Port Haney, B. C., to have a daily capacity of 400,000 ft.

Plans have been completed for the proposed enlargement of the Schaae Co.'s plant in Vancouver, B. C. The shop building and store house will be enlarged and new pattern shops and foundry, 40 x 120 ft., will be built.

Construction has been started on the sawmill at Bay City, Ore., by the Cummings-Moberly Lumber Co. of Louisiana, which has recently established offices in the Lewis Building, Portland. The plant will have an 8-hr. capacity of 150,000 ft. A machine shop, 40 x 75 ft., will also be built. The plant will be electrically operated throughout.

The Riverview Shingle Mill Co.'s plant, Everett, Wash., was recently destroyed by fire, with loss of \$25,000. Plans for rebuilding have not been announced.

The Willamette Brass Foundry Co., Portland, Robert Gray, owner, has secured a site for a new foundry and work will start shortly.

A controlling interest in the Patterson-MacDonald Shipbuilding Co., and an interest in the Seattle North Pacific Shipbuilding Co., Seattle, has been purchased by James Black of the Black Masonry & Contracting Co., St. Louis, and associates. The Seattle-North Pacific Co. was formerly the Erickson Engineering Co., and is completing a large steel shipbuilding plant on the Duwamish Waterway. The Patterson-MacDonald plant builds wooden vessels, and is now building 10 4200-ton ships for the Australian Government.

San Francisco

SAN FRANCISCO, July 17.

The Hind-Rolph Investment Co., San Francisco, has been incorporated by George U. Hind, James Rolph and C. P. Chamberlain with a capital of \$1,000,000 to build ships and construct and operate sawmills.

The United Engineering Co., San Francisco, is planning to establish a shipbuilding plant at Sausalito. Application has been made to the War Department for a permit to build the necessary structures into the bay.

The Edwin Forrest Forge Co., San Francisco, is building a one-story forge shop in Oakland at a cost of \$10,000.

The Enterprise Foundry Co., San Francisco, has added a 30-ton electric crane to its equipment.

The Phoenix Iron Works, Oakland, is building a one-story foundry at a cost of \$3,000.

The Boston Machine Shops, Oroville, has sold its machinery to the Union Construction Co., San Francisco, for the shipbuilding plant the latter is erecting in Oakland.

The Liberty Machine Co., San Francisco, has been incorporated with \$25,000 to manufacture machinery and appliances. W. E. Jewel, A. Haase, William Lauten, San Francisco; C. G. Chipchase, Alameda, and B. H. Berber, Mill Valley, are the incorporators.

Canada

TORONTO, July 22.

With the placing of large American orders for shells and increased orders for 18-lb. shrapnel shells, machinery manufacturers of Canada were put in a position from which they have not yet recovered. Large orders have been placed by companies turning out 12-in. shells, and in some cases delivery of machines for this work is delayed on account of shortage of material and labor. The P. B. Yates Machine Co., Ltd., Hamilton, Ont., has arranged with the Root & Van Dervoort Engineering Co., East Moline, Ill., to build its entire line of shell making lathes in its Hamilton plant. These lathes will cover the work of 4.5-in., 155-mm., 6-in. and 9.2-in. shells. There is considerable tendency on the part of Canadian concerns to purchase new instead of second-hand machinery. One large dealer stated that his firm was discouraging the purchase of second-hand machines, as his experience was that better results were obtained with new machines. As a matter of fact there is not much second-hand equipment coming into the warehouses. Several new plants in the vicinity of Montreal are about ready for the installation of machinery and expect to have their plants ready in a couple of months for the manufacture of shells for the United States and British governments.

The Elgin Mfg. Co., Ltd., London, Ont., has been incorporated with a capital stock of \$25,000 by Ernest G. Yeates,

Rufus C. Macknight, Edward D. Parke and others to manufacture machinery, tools, hardware, etc.

The Paladin Metallic Co., Ltd., Toronto, has been incorporated with a capital stock of \$100,000 by Thomas H. Wilson, 104 Lyndhurst Avenue; Jacob W. Broudy, Temple Building; William R. Bird and others to manufacture machinery, tools, etc.

The Salisbury Electric Co., Ltd., Toronto, has been incorporated with a capital stock of \$100,000 by George E. McCann, 15 Washington Avenue; Francis A. Hammond, Arthur F. Ball and others to manufacture machinery, electrical equipment, engines, motors, etc.

T. McAvity & Sons, Ltd., 13 King Street, St. John, N. B., is building an addition to its shell plant at a cost of \$100,000.

The United Brass & Lead Co., Ltd., 284 St. Helens Avenue, Toronto, is in the market for a milling machine, about 40 in. table travel.

Keenan Brothers, Owen Sound, Ont., are in the market for a horizontal shingle machine, Perkins or Peterboro make preferred.

Bids are being received until July 30 by John A. Pearson, architect, Centre Block, Parliament Hill, Ottawa, Ont., for three water tanks, also two centrifugal pumps, for the Parliament Buildings.

With a capital stock of \$5,000,000 a new shipbuilding company has been formed which will operate a yard on the St. Lawrence River, opposite Quebec. The new firm will take in a number of existing companies, including the Federal Shipbuilding Co., Sarnia, Ont.; the Dominion Shipbuilding Co., Collingwood, Ont., and Dussault & Hutchison, Levis, Que. The company will build steel vessels for the French Government and will commence the construction of docks and yards immediately.

The Canadian Hart Wheels Co. is moving from Barton Street East, Hamilton, Ont., to its new plant on Burlington Street East, which is being vacated by the Monarch Metal Co.

J. H. Connor & Son, Ltd., Ottawa, is in the market for an engine lathe, 16 in. swing, 6 or 8 ft. bed; a screw machine about 14 in. swing, and one plain milling machine.

The Industrial Specialty Mfg. Co., Ltd., Montreal, has been incorporated with a capital stock of \$50,000 by John W. Blair, Francis J. Laverty, both of Westmount, Que.; Charles A. Hale, Montreal West, and others to manufacture machinery, tools, implements, etc.

The North American Arms Co., Ltd., Quebec, has been incorporated with a capital stock of \$2,000,000 by Edmond B. Ryckman, John S. Denison, Hugh D. Scully, Toronto, as provisional directors. John A. Russell, Toronto, is also interested in the company, which has leased the Ross rifle factory at Quebec for 18 months, with provision for renewal. The plant will be equipped for the manufacture of revolvers for the United States Government, for which the company has received a large order.

John Forsyth, Ltd., Kitchener, Ont., has been incorporated with a capital stock of \$300,000 by John D. C. Forsyth, Edwin W. Clement, William P. Clement and others to manufacture engines, machinery, dynamos, generators, etc.

A. A. Giddings & Co., Ltd., Montreal, has been incorporated with a capital stock of \$50,000 by Louis A. David, Louis P. Crepeau, S. H. R. Bush and others to manufacture electrical and mechanical appliances, machinery, etc.

A portion of the plant, together with machinery and shells, was destroyed when the third floor of the munitions plant of Lymburner, Ltd., Montreal, crashed through to the basement. The loss is estimated at about \$250,000. The plant will be rebuilt and new machinery purchased.

The plant of the Thomas Pink Co., Ltd., Pembroke, Ont., manufacturer of logging chains, machinery, tools, etc., was totally destroyed by fire July 15. The loss to building and machinery will amount to \$400,000.

Bids are being received until July 30 by James, Loudon & Hertzberg, Ltd., Toronto, for building an addition to the pumping plant and filtration house at Weston, Ont., to cost about \$40,000.

The Eburne Sawmill, owned by Roe & Abernethy, Hudson Street, Vancouver, B. C., which was recently destroyed by fire with a loss of \$65,000, will be rebuilt at a cost of \$70,000. New machinery will be required.

Bids will be called shortly for a waterworks plant for the town of Pembroke, Ont., to cost about \$60,000. J. B. McRae, Booth Building, Sparks Street, Ottawa, is engineer.

The Hydraulic Machinery Co., Ltd., 18 Tansley Street, Montreal, will build an addition to its machine shop to cost \$5,000.

The P. Lyall & Sons Construction Co., Ltd., 701 Transportation Building, Montreal, will build a two-story reinforced concrete and brick shell plant at a cost of \$200,000. L. A. Amos, 78 Crescent Street, is the architect.

Plans are being prepared for the erection of a factory and addition to the machine shop for the Bowden Machine Co., 163 Sterling Road, Toronto, to cost \$50,000. James, Loudon & Hertzberg, Ltd., Toronto, are the engineers.

J. I. Smith, Lacroix Slip, Chatham, Ont., will build a two-story machine shop at a cost of \$10,000.

Government Purchases

WASHINGTON, July 22.

Bids were received at the Bureau of Supplies and Accounts, Navy Department, Washington, July 12, for furnishing equipment for the naval service, as follows:

Schedule 4789½, Steam Engineering:

Class 474, Boston—Two motor-driven 15-in. universal shaping machines—Bid —, \$1,085; 113, \$1,120 and \$1,110; 128, \$1,535.

Schedule 4781½, Yards and Docks:

Class 479, Mare Island—Two 15-ton electric traveling cranes—Bid 21, \$6,682.50; 73, \$14,300; 106, \$17,000; 112, \$15,705; 116, \$13,730; 131, \$17,000; 174, \$14,727.

Class 480, Mare Island—Two 5-ton electric traveling cranes—Bid 21, \$9,200; 29, \$10,660; 31, \$8,746; 73, \$5,955; part: 112, \$4,600; 116, \$11,930; 131, \$9,850; 174, \$11,000.

Schedule 3856½, Steam Engineering:

Class 501, Philadelphia—One 16-in. crank shaper—Bid 49, \$1,317; 65, \$1,355; 77, \$1,085; 112, \$1,419; 113, \$1,440; 116, \$1,575; 143, \$1,550; 146, \$1,550; 146, \$1,510; 155, \$1,856; 170, informal; 185, \$650, part.

Class 502, Philadelphia—One motor-driven 16-in. drill—Bid 49, \$344.50; 79, \$220.50; 95, \$203.50; 112, \$288; 113, \$186; 153, \$408; 155, \$335.

Bids were received similarly July 15, covering specifications as follows:

Schedule 4826½, Construction and Repair:

Class 517, Mare Island—One press—Bid 54, \$1,077; 62, \$2,454.58 and \$2,754.68; 138, \$1,530; 140, \$2,650.

Schedule 4846½, Steam Engineering:

Class 541, Philadelphia—One motor-driven shaper—Bid 97, \$2,032 and \$2,147; 104, \$1,950; 143, \$1,815.

Schedule 4897½, Construction and Repair:

Class 547, Hoists—Bid 27, \$6,648; 158, \$16,075.

Alternate bid. Do. f. o. b. works—Bid 27, \$3,144.

Schedule 4844½, Construction and Repair:

Class 552, Charleston—One pipe cutting and threading machine—Bid 95, \$1,085; 76, \$2,504.32; 112, \$1,770; 116, \$2,825; 130, \$2,775; 159, \$1,222.05.

Schedule 4837½, Steam Engineering:

Class 557, Annapolis—One steam hammer—Bid 12, \$1,122; 47, \$730; 90, \$910; 95, \$1,120; 98, \$940.

The names of the bidders and the numbers under which they are designated in the above lists are as follows:

Bid 21, The Bedford Foundry & Machine Co.; 29, Alfred Box & Co.; 31, Cameron Engineering Co.; 49, Wm. F. Davis Machine Tool Co.; 65, Fairbanks Co.; 73, A. D. Grainger & Co.; 75, Hamilton & Chambers Co.; 77, Hollingsworth Machine Tool Co.; 79, Hoefer Mfg. Co.; 95, Kemp Machinery Co.; 106, Milwaukee Electric Crane & Mfg. Co.; 112, Manning Maxwell & Moore, Inc.; 113, D. Nast Machinery Co.; 116, Niles-Bement-Pond Co.; 128, Potter & Johnston Machine Co.; 131, Pawling & Harnischfeger Co.; 143, W. E. Shipley Machinery Co.; 146, Swind Machinery Co.; 153, Sipp Machine Co.; 155, Sherritt & Stoer Co.; 170, Vandeyck-Churchill Co.; 174, Whiting Foundry Equipment Co.; 185, Young, Corley & Dolan, Inc.; 12, Buffalo Foundry & Machine Co.; 27, Chisholm-Moore Mfg. Co.; 47, Erie Foundry Co.; 54, Farrel Foundry & Machine Co.; 62, Hydraulic Press Mfg. Co.; 97, Newton Machine Tool Works; 104, Pratt & Whitney Co.; 138, R. D. Wood & Co.; 140, Watson-Stillman Co.; 158, Brown Hoisting Machinery Co.

The Willamette Iron & Steel Works, Portland, Ore., has opened a branch office at 428 Widener Building, Philadelphia, in charge of H. T. Humphrey, who was manager several years of the company's boiler shop department. In addition to negotiating with the Emergency Fleet Corporation for additional contracts for Scotch marine boilers, of which the company builds 15 monthly, Mr. Humphrey will keep in touch with Eastern manufacturers who are furnishing material for the 8800-ton ships which the Willamette Iron & Steel Works, with the Northwest Steel Co., is building for the Emergency Fleet Corporation. In June, the Willamette company delivered three ships; in July it will deliver two, and in August two.

